Bang & Olufsen

CD

New Version, CDM12

Master Panel AV 9000

Type 2621, 2622

Stand

Type 2018

SERVICE MANUAL

1 FM/AM, RF, IF decoder ..... diagr. A page 2-9

2 Input Select ..... diagr. B page 2-10

2 Power supply ..... diagr. C page 2-11

3 Microcomputer ..... diagr. F+f page 2-14, 2-15

4 Keyboard ..... diagr. G page 2-16

5 Display ..... diagr. G page 2-16

6 Door sensors ..... diagr. H page 2-17

7 Tape data control ..... diagr. C page 2-11

7 Tape AF and control ..... diagr. D page 2-12

7 Dolby and tape type logic ..... diagr. E page 2-13

8 CD servo motor system and disc detector ..... diagr. I page 2-18

8 CD decoder ..... diagr. J page 2-19

9 Light and motor control ..... diagr. K page 2-20

10 RDS ..... diagr. L page 2-21

11 Right door sensor ..... diagr. H page 2-17

17 Tuner ..... page 2-3

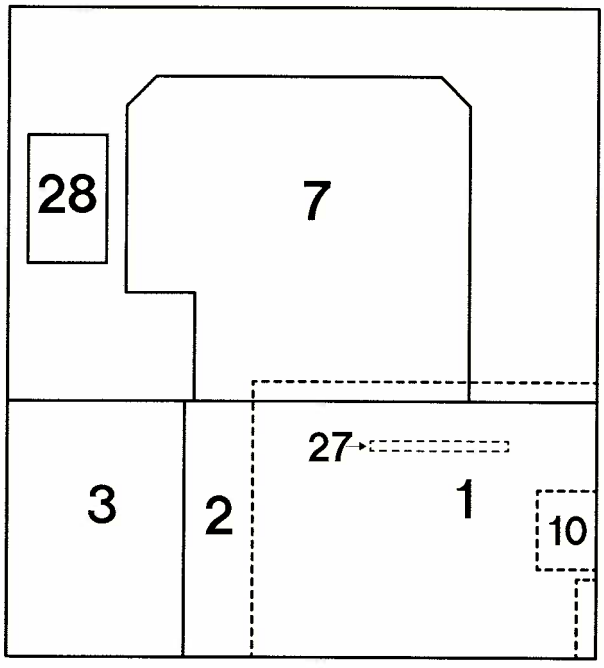
20 Disc detector ..... diagr. I page 2-18

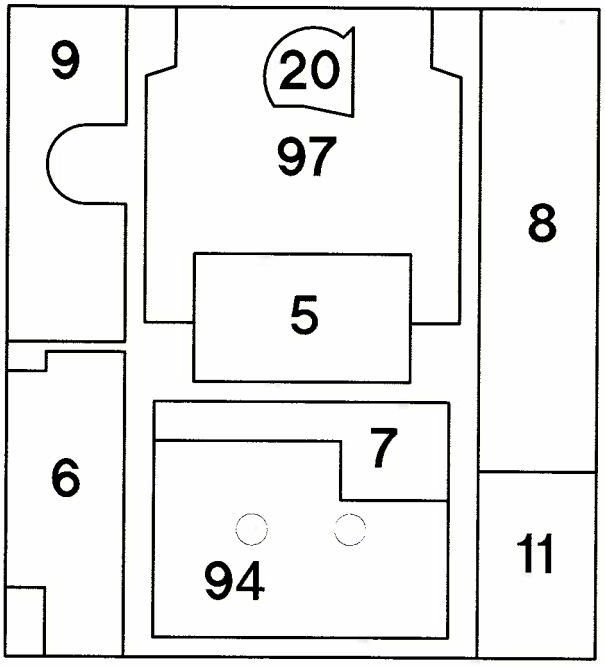
27 Master Link interface ..... diagr. B page 2-10

28 Light control output ..... diagr. K page 2-20

94 Tape mechanism ..... page 4-5

97 CD mechanism ..... page 4-1

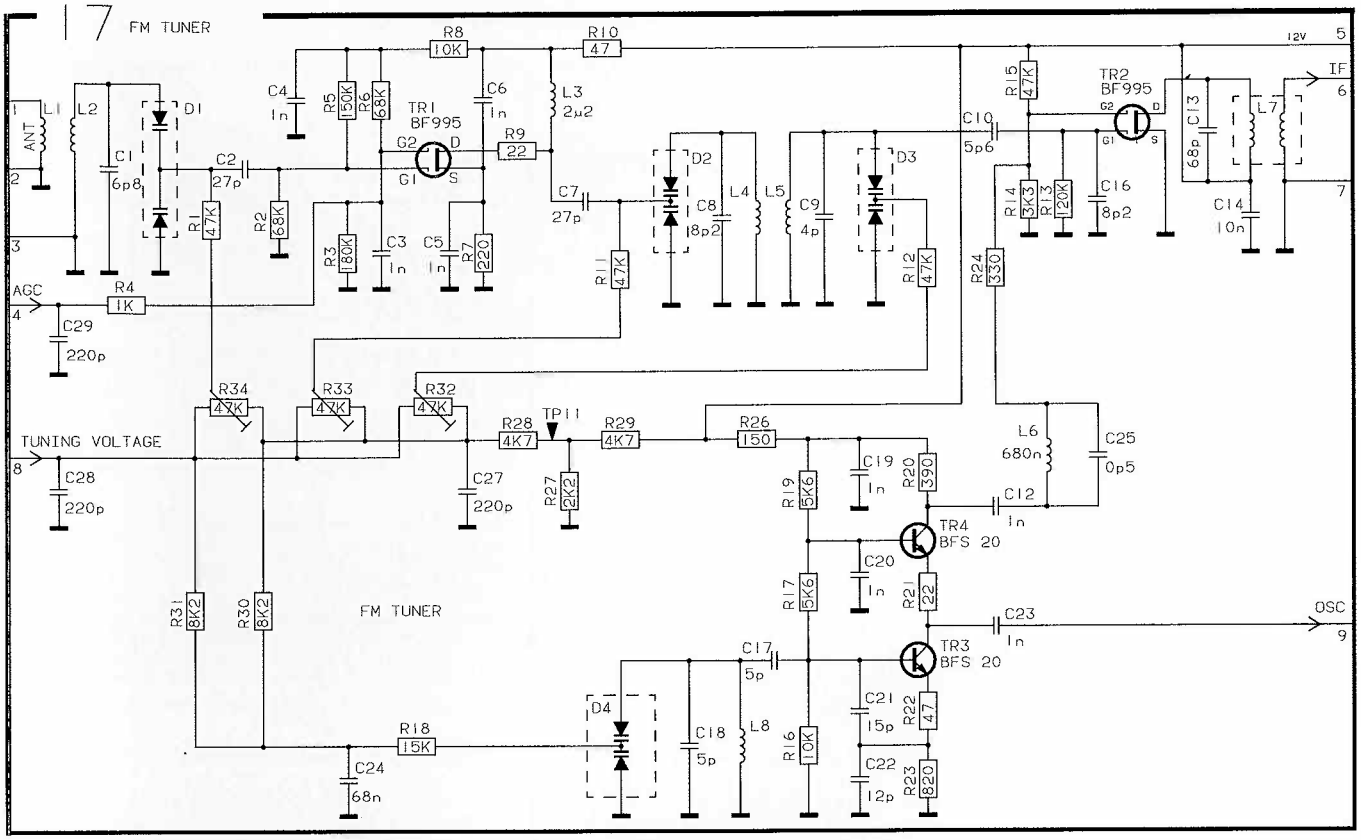




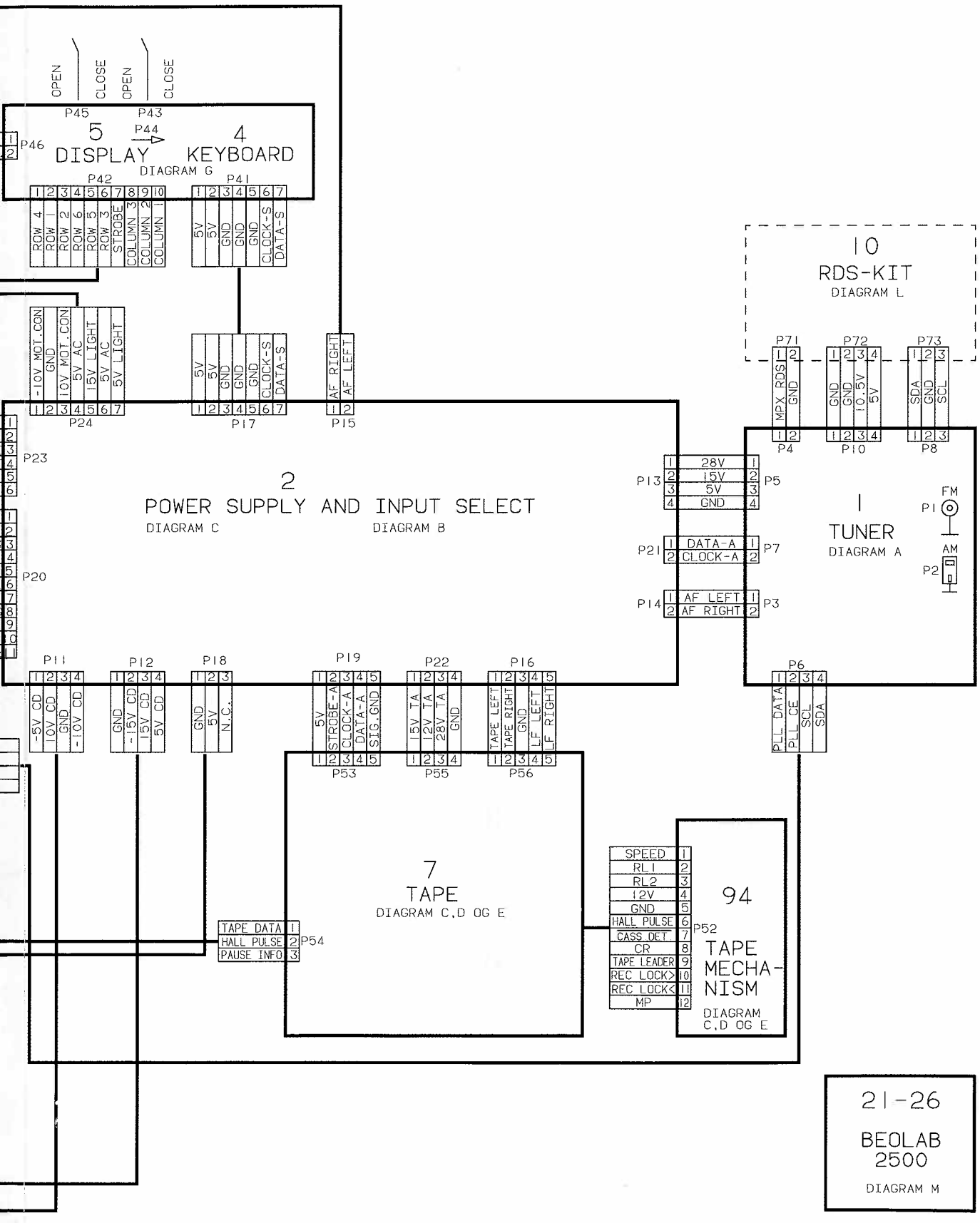
Master Panel AV9000

2-3

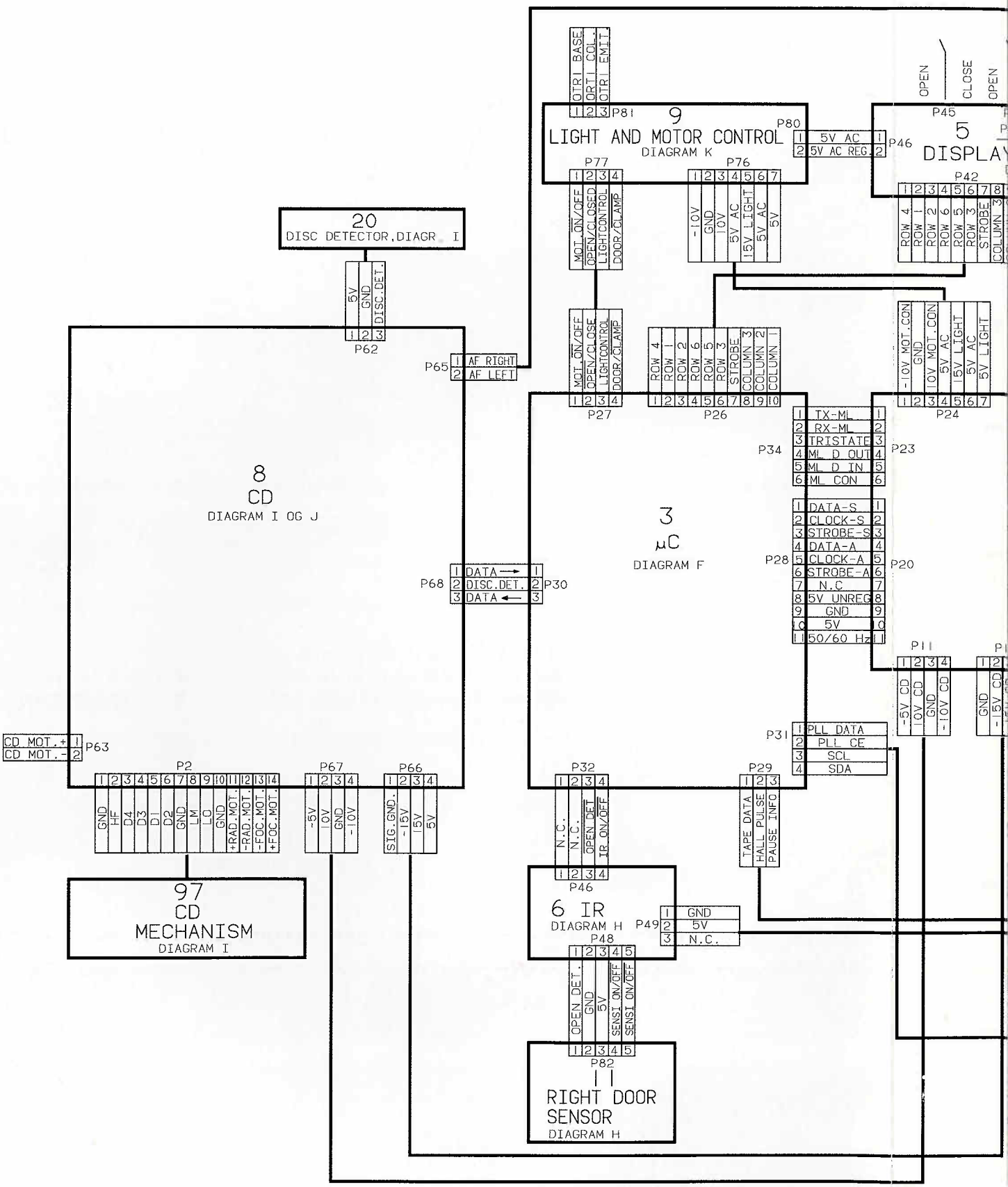
FM TUNER



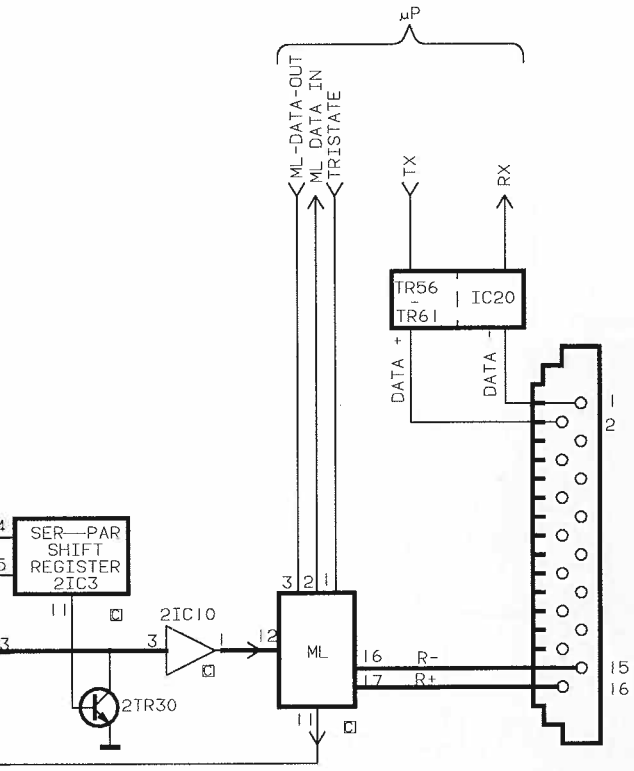
The FM TUNER is a single unit.
With failure in this unit we recommend replacing the Whole unit.
However the part nos. of semi-conductors are in the lid of the semi-conductors.


OPEN
CLOSE
OPEN
CLOSE
P45
P43
5
DISPLAY
P44
4
KEYBOARD
DIAGRAM G
P46
P42
P41
ROW 4
ROW 1
ROW 2
ROW 6
ROW 5
ROW 3
STROBE
COLUMN 3
COLUMN 2
COLUMN 1
5V
5V
GND
GND
GND
CLOCK-S
DATA-S
10
RDS-KIT
DIAGRAM L
P71
P72
P73
MPX RDS
GND
GND
GND
10.5V
5V
SDA
GND
SCL
P4
P10
P8
-10V MOT.CON
GND
10V MOT.CON
5V AC
15V LIGHT
5V AC
5V LIGHT
P24
P17
AF RIGHT
AF LEFT
P15
P23
2
POWER SUPPLY AND INPUT SELECT
DIAGRAM C
DIAGRAM B
P13
28V
15V
5V
GND
P5
1
TUNER
DIAGRAM A
FM
P1
AM
P2
P21
DATA-A
CLOCK-A
P7
P14
AF LEFT
AF RIGHT
P3
P20
P11
P12
P18
P19
P22
P16
P6
-5V CD
10V CD
GND
-10V CD
GND
-15V CD
15V CD
5V CD
GND
5V
N.C.
5V
STROBE-A
CLOCK-A
DATA-A
SIG.GND
15V TA
12V TA
28V TA
GND
TAPE LEFT
TAPE RIGHT
GND
LF LEFT
LF RIGHT
PLL DATA
PLL CE
SCL
SDA
P53
P55
P56
7
TAPE
DIAGRAM C,D OG E
TAPE DATA
HALL PULSE
PAUSE INFO
P54
SPEED
RL1
RL2
12V
GND
HALL PULSE
CASS DET
CR
TAPE LEADER
REC LOCK>
REC LOCK<
MP
P52
94
TAPE
MECHA-
NISM
DIAGRAM
C,D OG E
21-26
BEOLAB
2500
DIAGRAM M

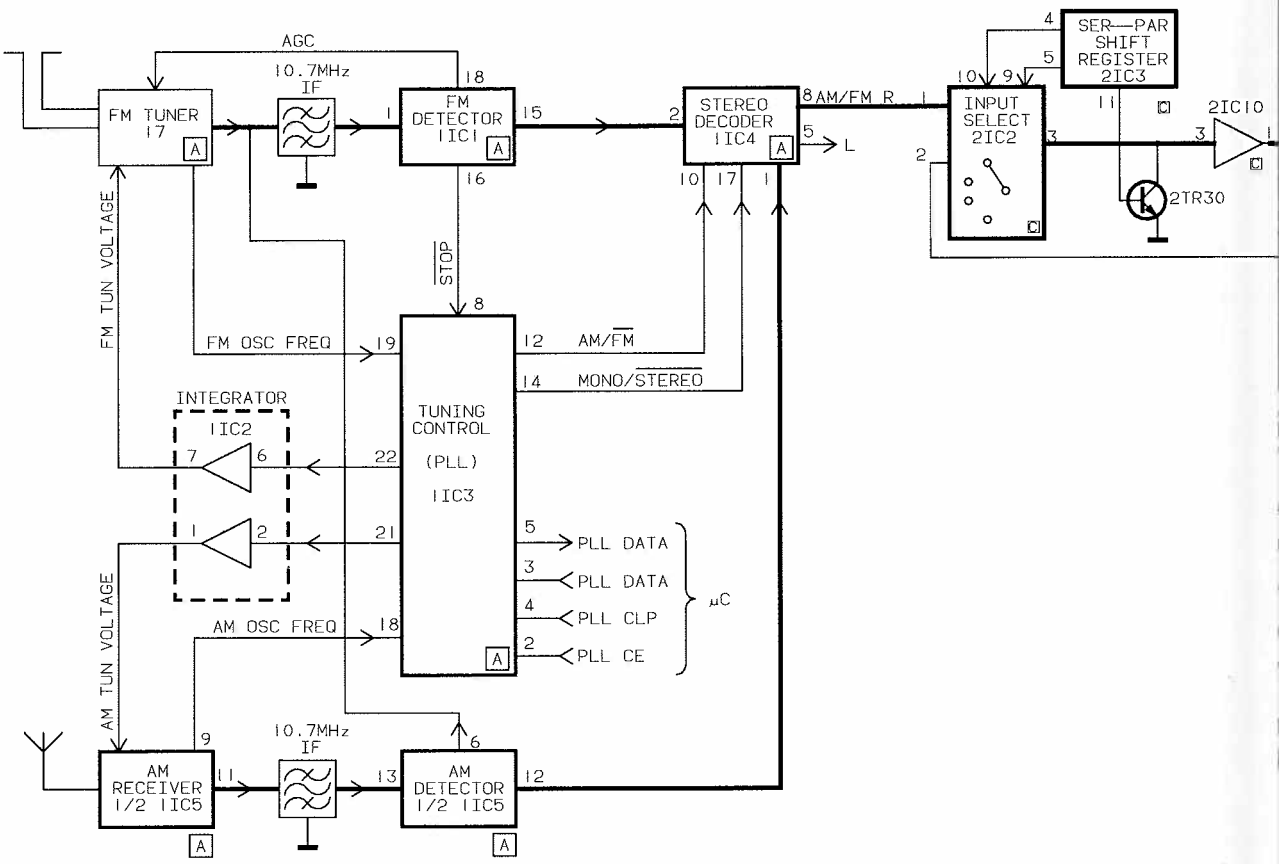
WIRING DIAGRAM

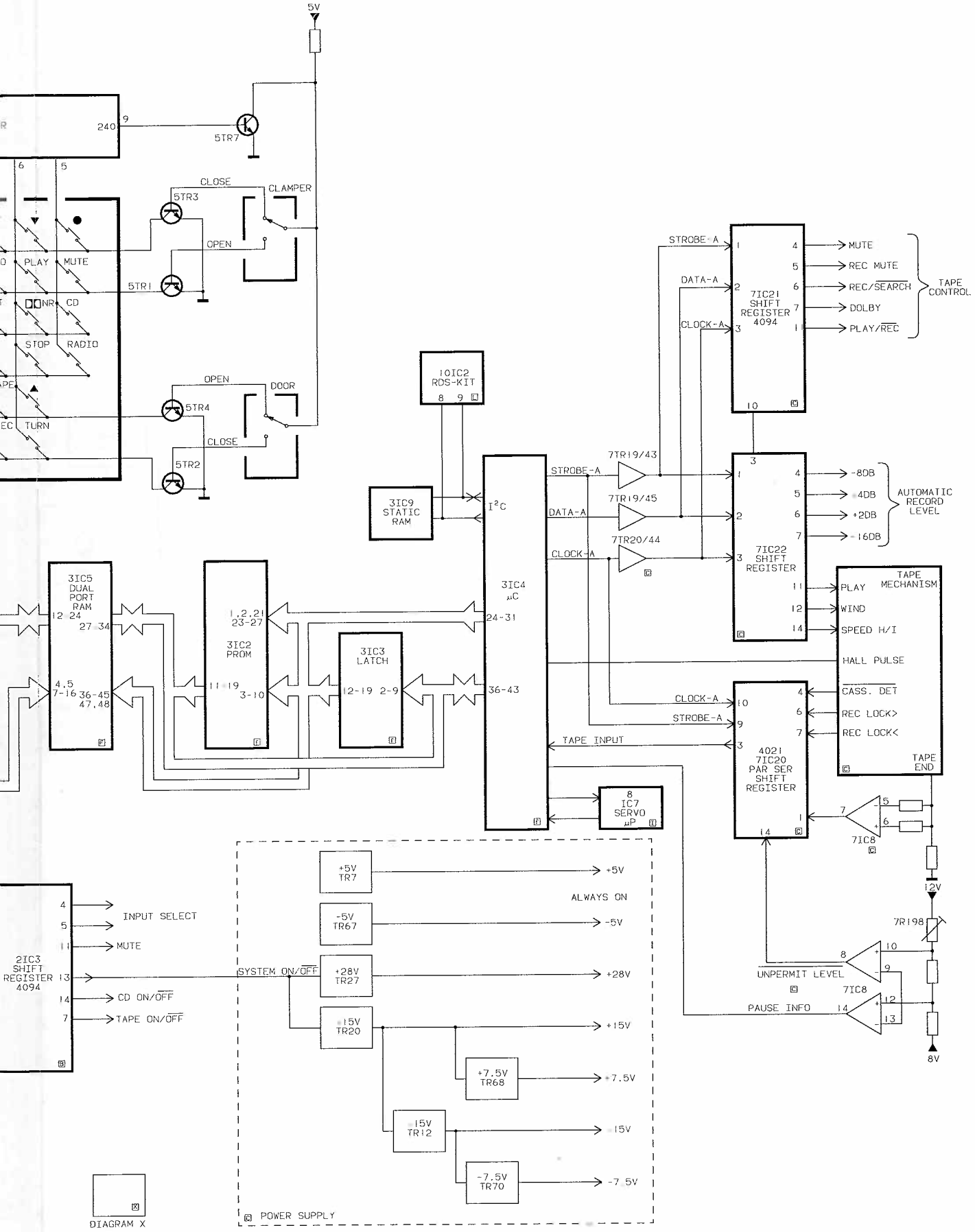


2-5
BLOCK DIAGRAM

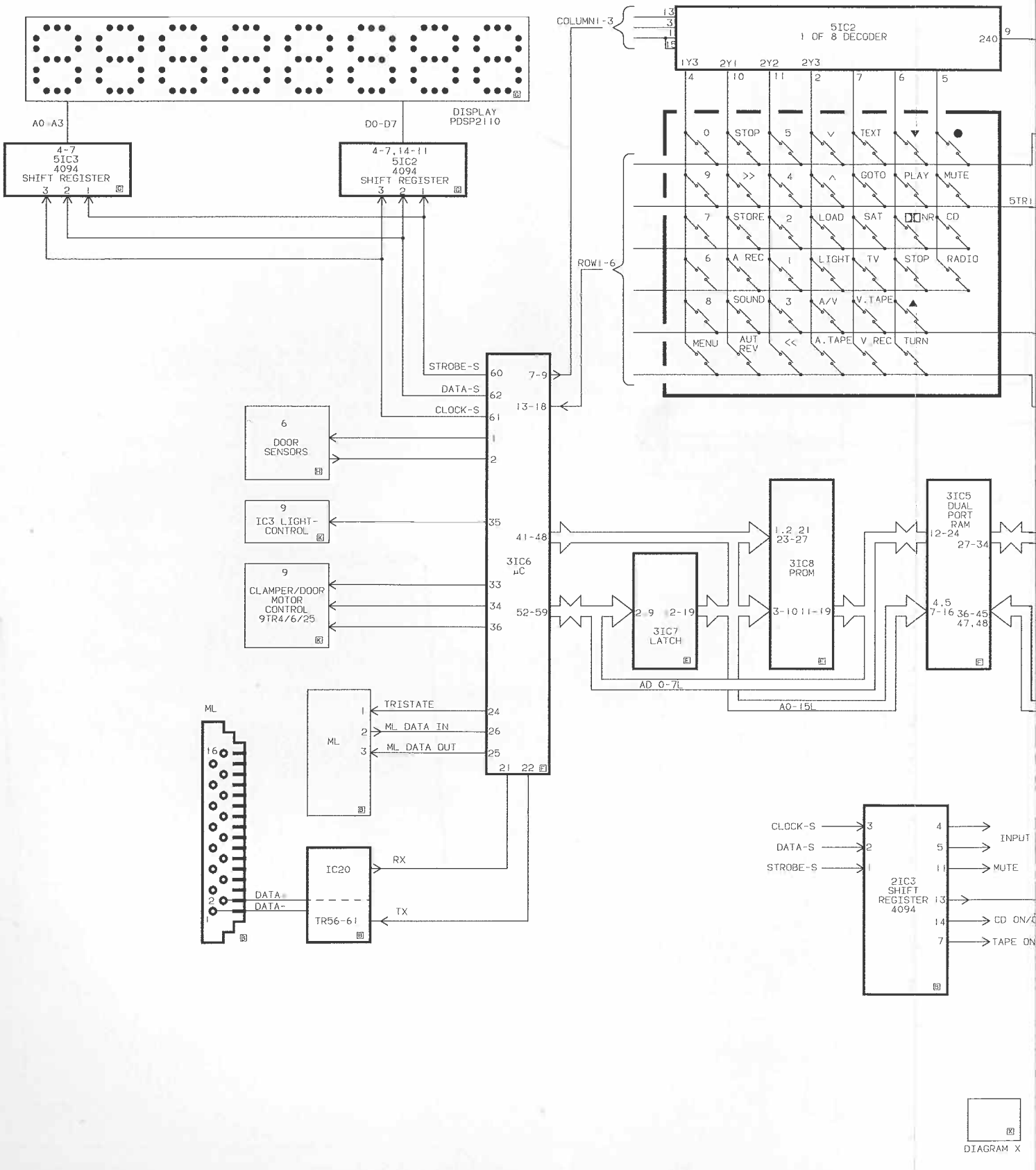


BLOCK DIAGRAM TUNER

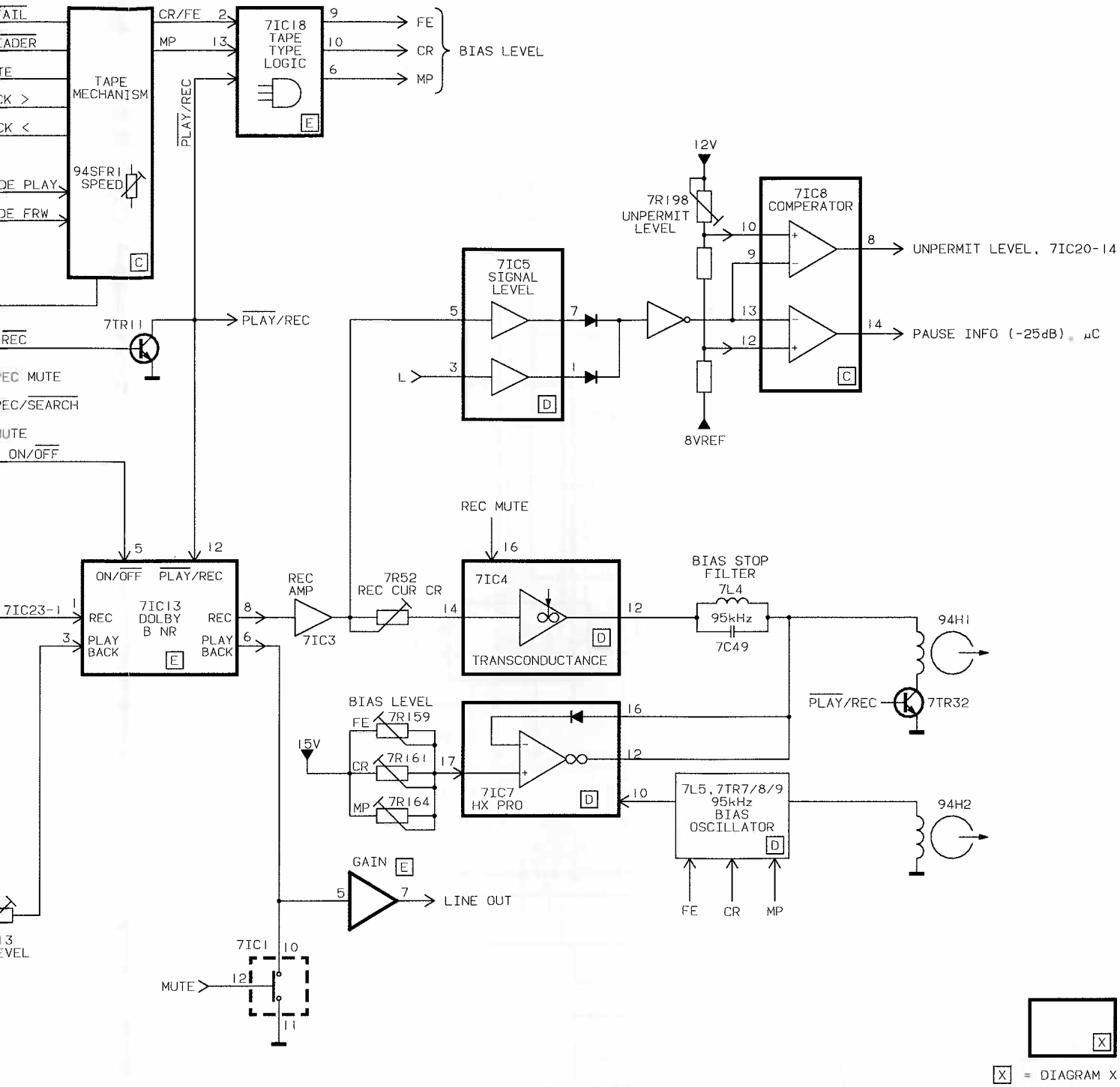



5V
5TR7
240
CLOSE
CLAMPER
5TR3
OPEN
5TR1
PLAY
MUTE
NR
CD
STOP
RADIO
OPEN
DOOR
5TR4
TURN
CLOSE
5TR2
10IC2
RDS-KIT
3IC9
STATIC
RAM
I²C
3IC4
µC
STROBE-A
DATA-A
CLOCK-A
7TR19/43
7TR19/45
7TR20/44
7IC21
SHIFT
REGISTER
4094
MUTE
REC MUTE
REC/SEARCH
DOLBY
PLAY/REC
TAPE
CONTROL
7IC22
SHIFT
REGISTER
-8DB
-4DB
+2DB
+16DB
AUTOMATIC
RECORD
LEVEL
TAPE
MECHANISM
PLAY
WIND
SPEED H/I
HALL PULSE
CASS. DET
REC LOCK>
REC LOCK<
TAPE
END
4021
7IC20
PAR SER
SHIFT
REGISTER
TAPE INPUT
3IC5
DUAL
PORT
RAM
3IC2
PROM
3IC3
LATCH
8
IC7
SERVO
µP
7IC8
12V
7R198
8V
UNPERMIT LEVEL
PAUSE INFO
2IC3
SHIFT
REGISTER
4094
INPUT SELECT
MUTE
CD ON/OFF
TAPE ON/OFF
SYSTEM ON/OFF
+5V
TR7
-5V
TR67
+28V
TR27
15V
TR20
+7.5V
TR68
15V
TR12
-7.5V
TR70
ALWAYS ON
+5V
-5V
+28V
+15V
+7.5V
15V
-7.5V
POWER SUPPLY
DIAGRAM X

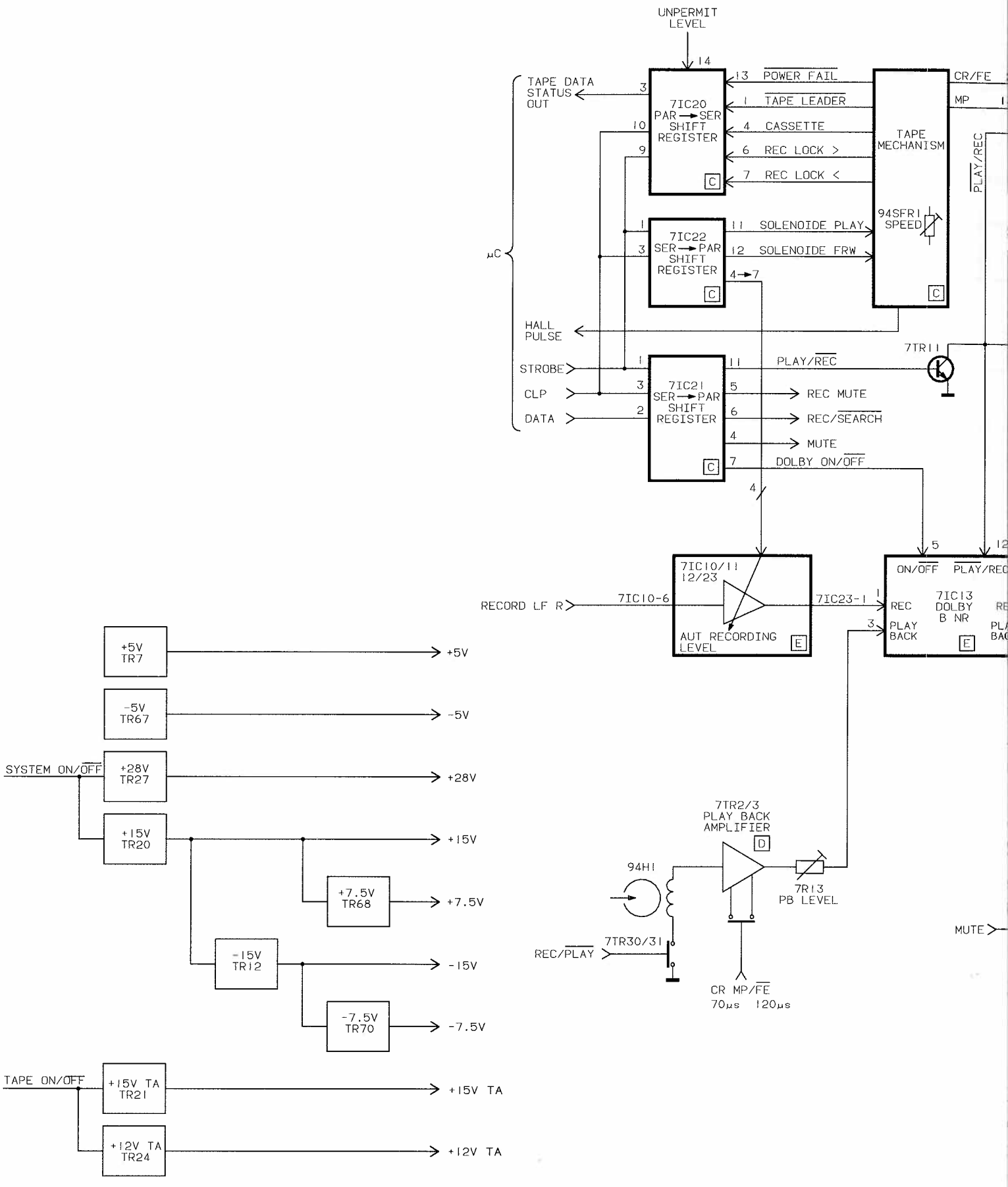
BLOCK DIAGRAM SYSTEM CONTROL

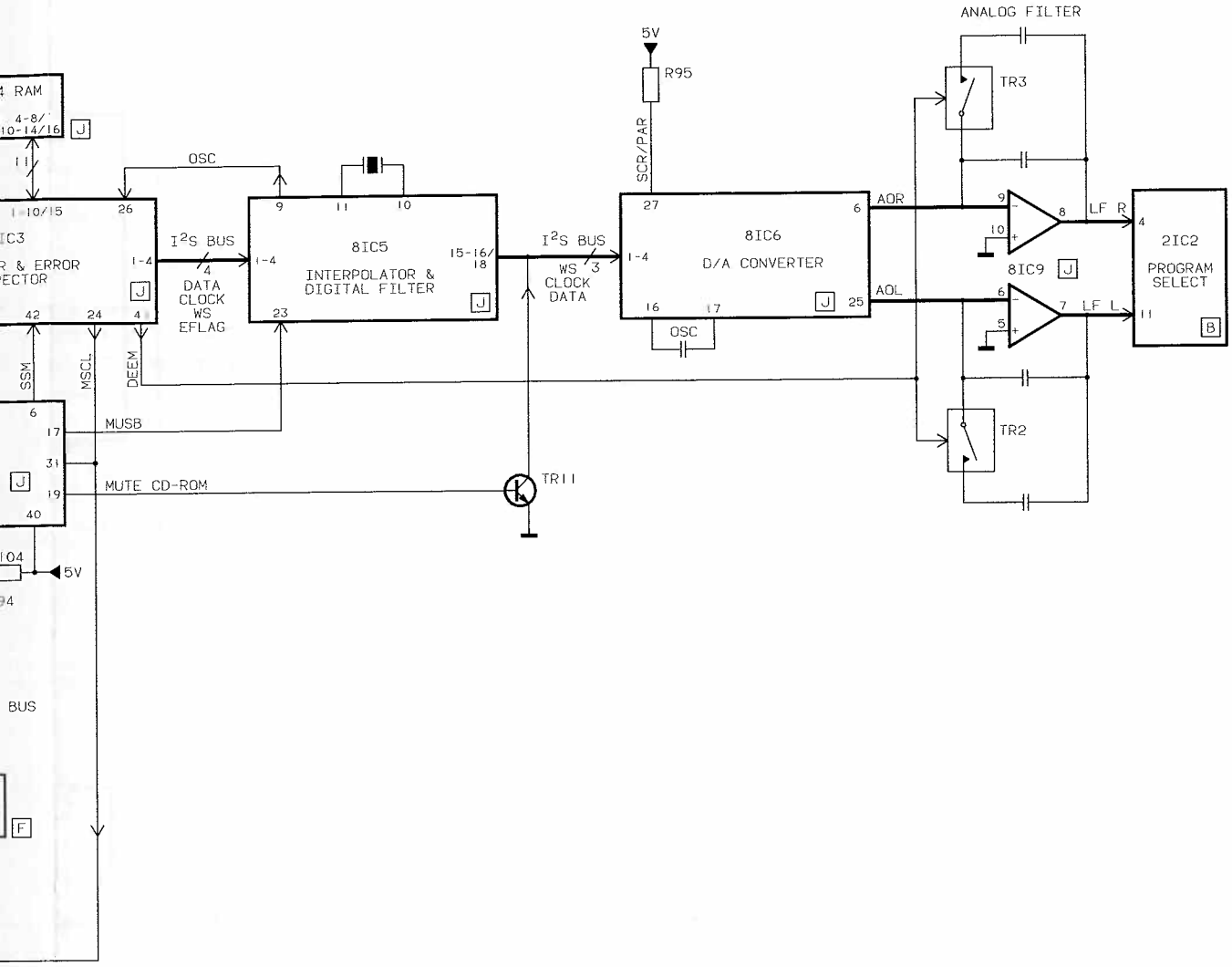


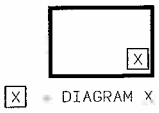
2-7
BLOCK DIAGRAM

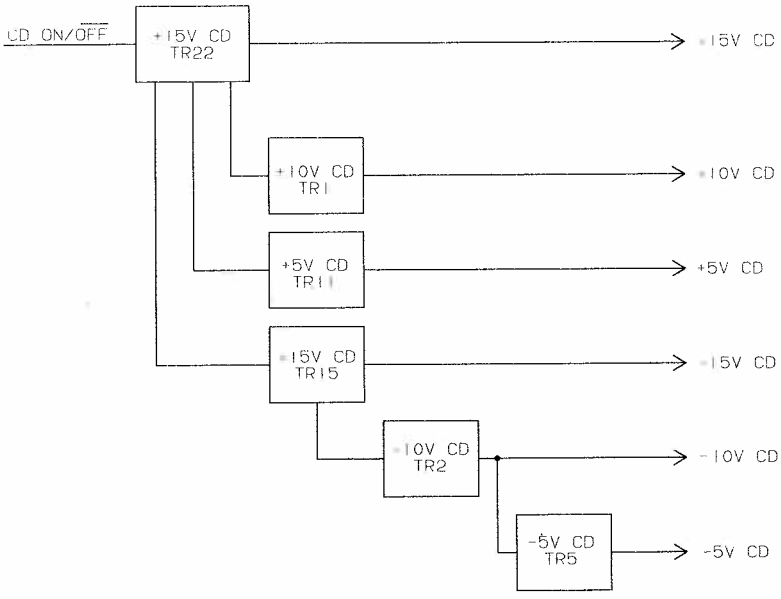


BLOCK DIAGRAM TAPE

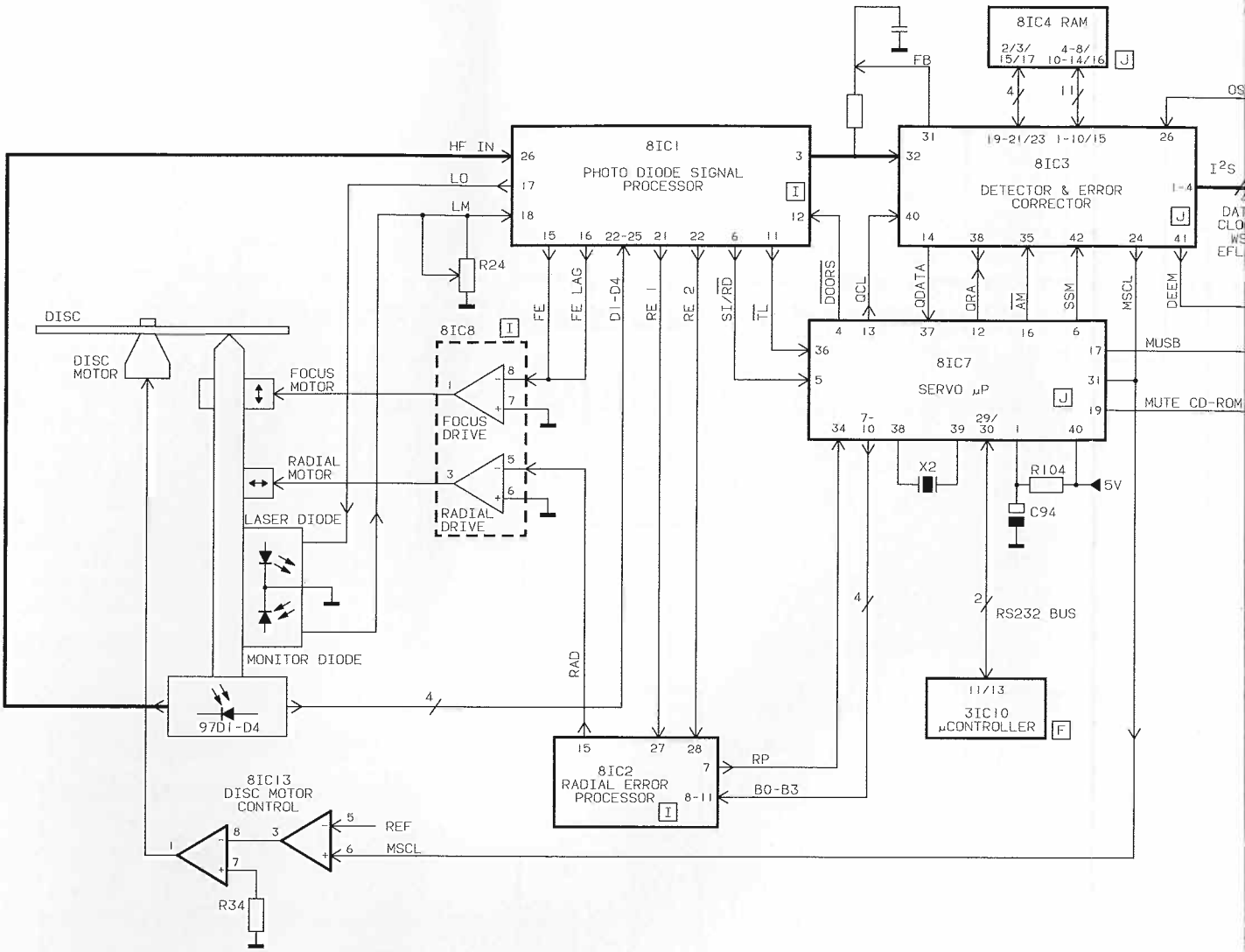


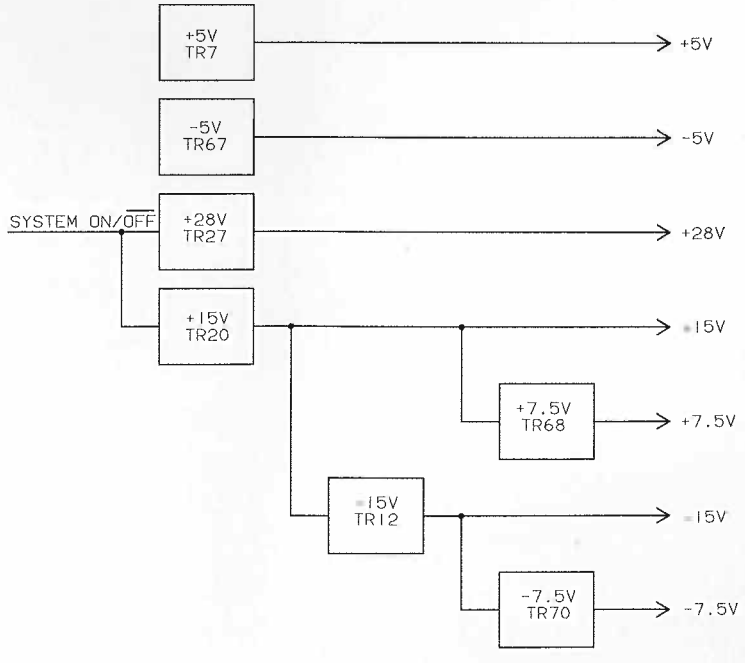

ANALOG FILTER
5V
R95
SCR/PAR
TR3
TR2
TR11
OSC
I²S BUS
4
DATA
CLOCK
WS
EFLAG
8IC5
INTERPOLATOR &
DIGITAL FILTER
I²S BUS
WS
CLOCK
DATA
3
8IC6
D/A CONVERTER
AOR
AOL
8IC9
LF R
LF L
2IC2
PROGRAM
SELECT
SSM
MSCL
DEEM
MUSB
MUTE CD-ROM
5V
BUS


X
X = DIAGRAM X


CD ON/OFF
+15V CD
TR22
+15V CD
+10V CD
TR1
+10V CD
+5V CD
TR11
+5V CD
+15V CD
TR15
+15V CD
-10V CD
TR2
-10V CD
-5V CD
TR5
-5V CD

BLOCK DIAGRAM CD





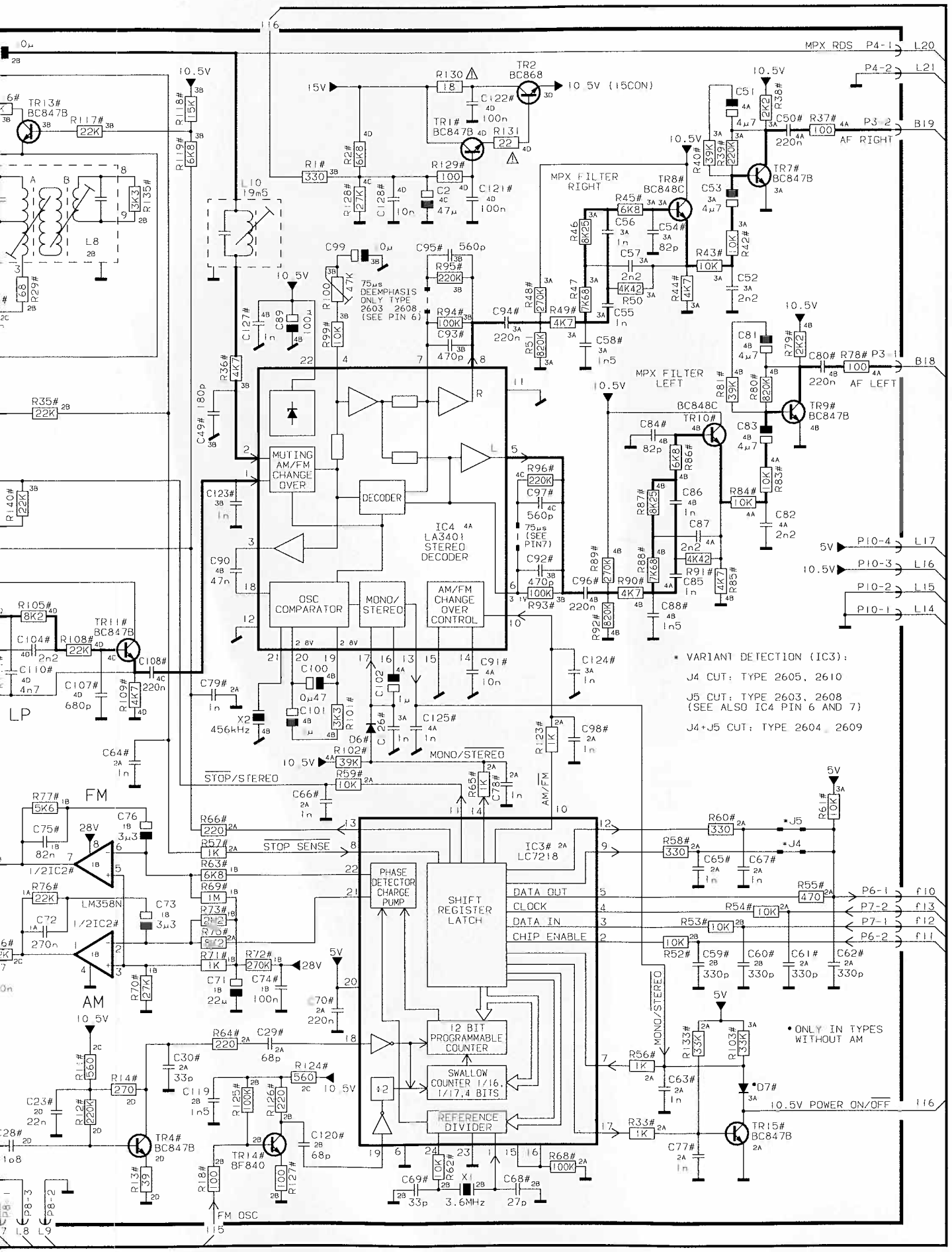
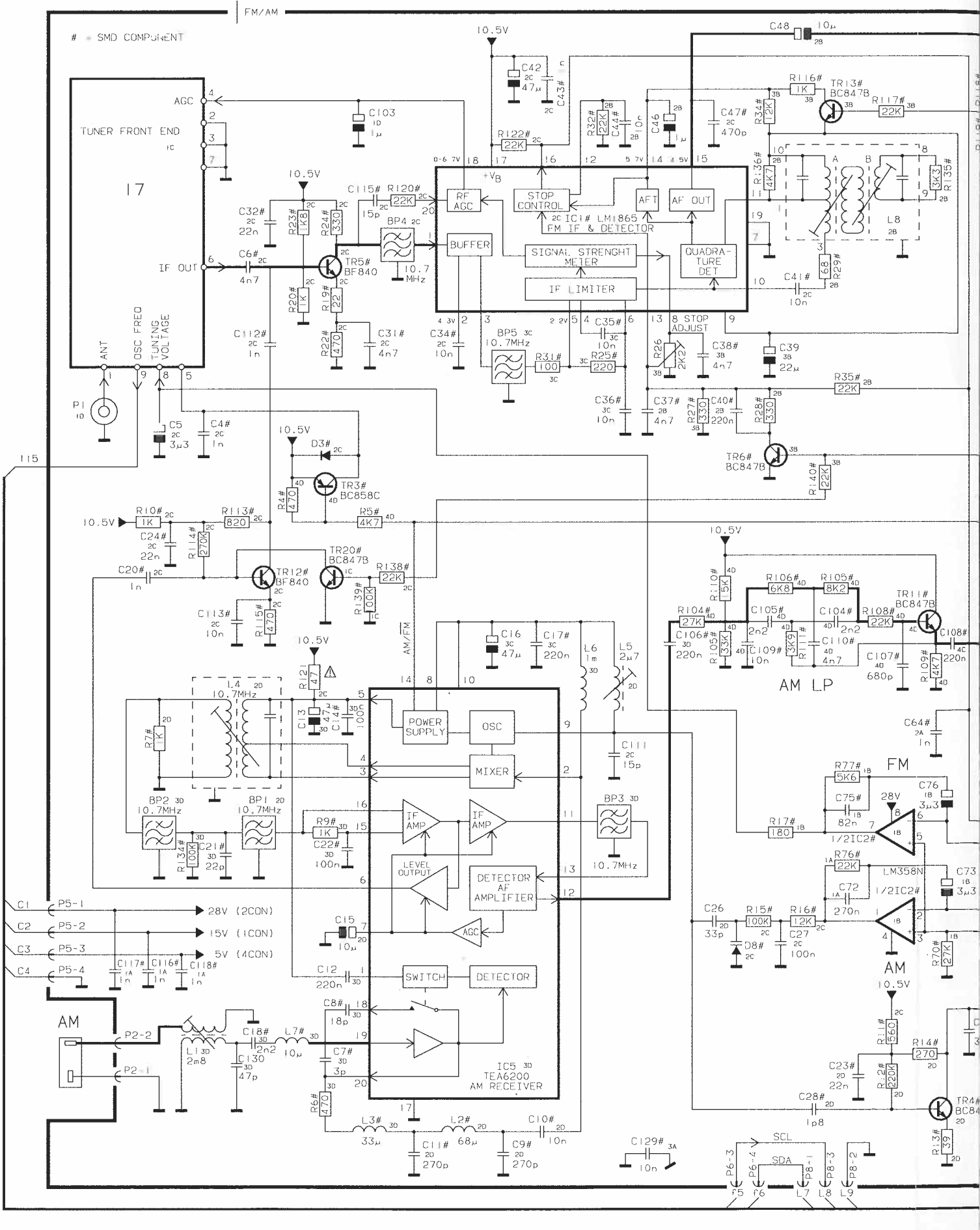

IC4 LA3401 STEREO DECODER
MUTING AM/FM CHANGE OVER
DECODER
OSC COMPARATOR
MONO/ STEREO
AM/FM CHANGE OVER CONTROL
IC3 LC7218
PHASE DETECTOR CHARGE PUMP
SHIFT REGISTER LATCH
12 BIT PROGRAMMABLE COUNTER
SWALLOW COUNTER 1/16, 1/17, 4 BITS
REFERENCE DIVIDER
MPX FILTER RIGHT
MPX FILTER LEFT
75µs DEEMPHASIS ONLY TYPE 2603 2608 (SEE PIN 6)
• VARIANT DETECTION (IC3):
J4 CUT: TYPE 2605, 2610
J5 CUT: TYPE 2603, 2608 (SEE ALSO IC4 PIN 6 AND 7)
J4+J5 CUT: TYPE 2604 2609
• ONLY IN TYPES WITHOUT AM
MPX RDS P4-1
P4-2
AF RIGHT
AF LEFT
10.5V POWER ON/OFF
STOP/STEREO
STOP SENSE
MONO/STEREO
DATA OUT
CLOCK
DATA IN
CHIP ENABLE
FM OSC
LP
FM
AM

DIAGRAM A FM/AM, RF, IF DECODER



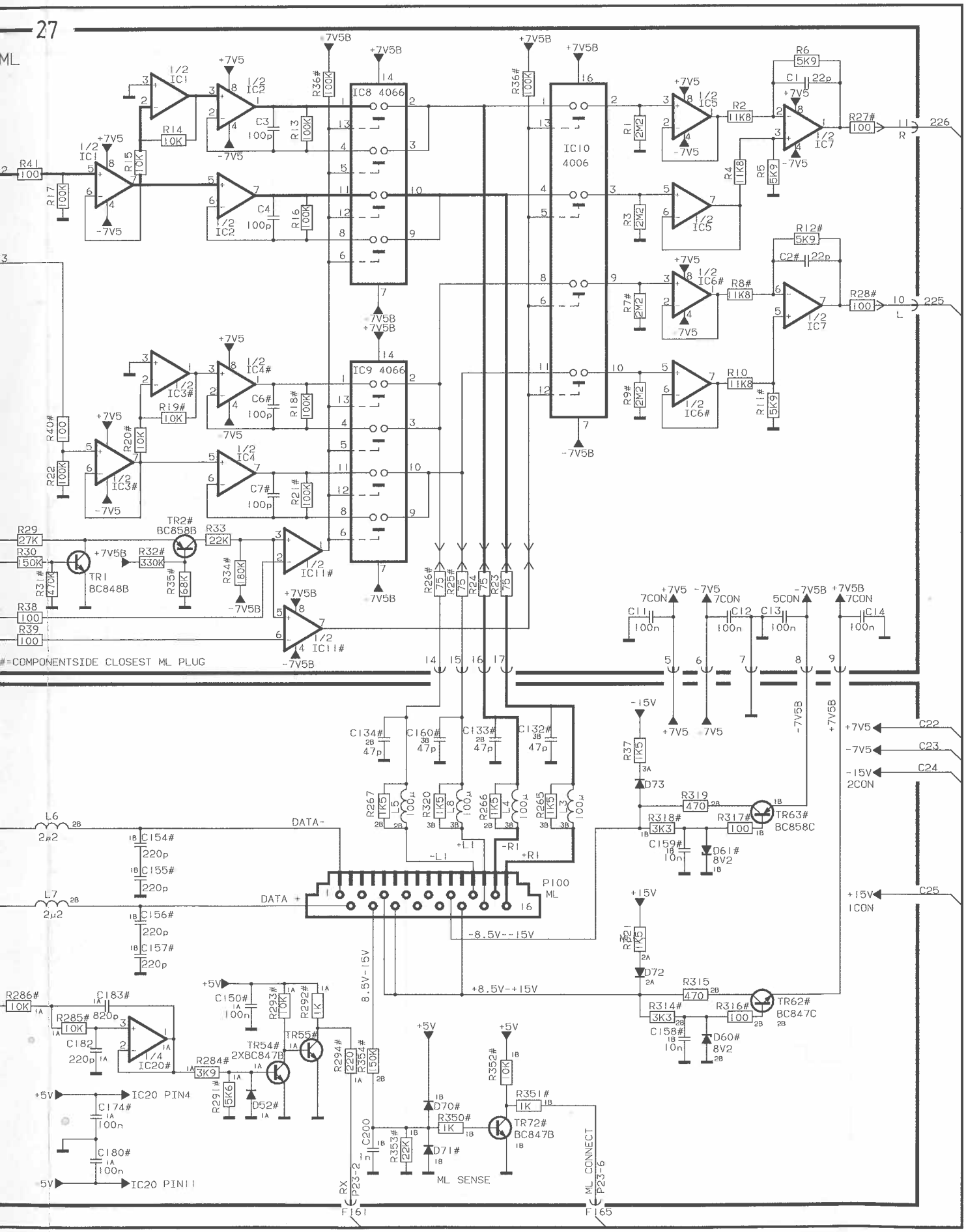
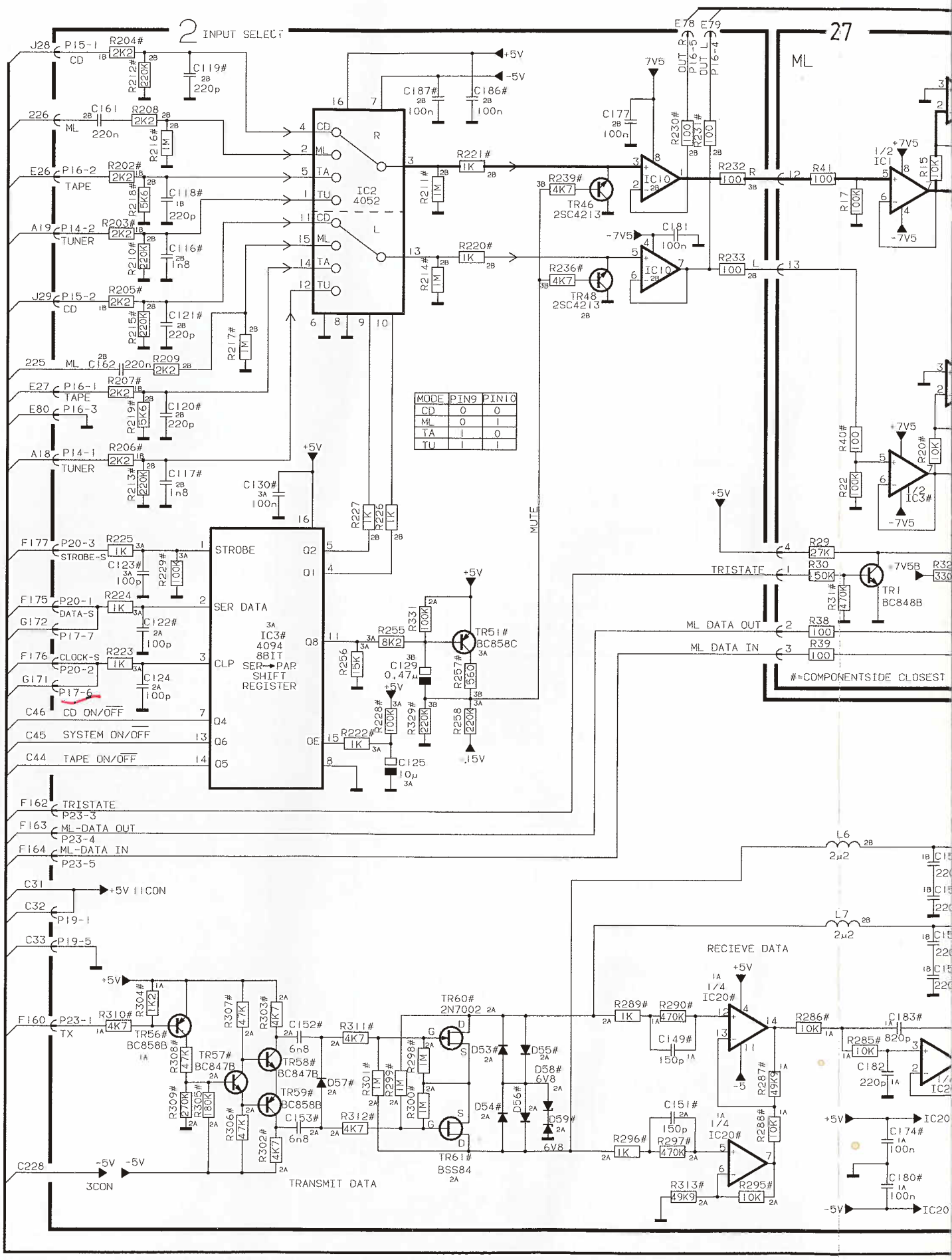

27
ML
IC1 1/2
IC2 1/2
IC3# 1/2
IC4 1/2
IC4# 1/2
IC5 1/2
IC6# 1/2
IC7 1/2
IC8 4066
IC9 4066
IC10 4006
IC11# 1/2
IC20# 1/4
+7V5B
+7V5
-7V5
-7V5B
R1 2M2
R2 11K8
R3 2M2
R4 11K8
R5 5K9
R6 5K9
R7# 2M2
R8# 11K8
R9# 2M2
R10 11K8
R11# 5K9
R12# 5K9
R13 100K
R14 10K
R15 10K
R16 100K
R17 100K
R18# 100K
R19# 10K
R20# 10K
R21# 100K
R22 100K
R23 75
R24 75
R25# 75
R26# 75
R27# 100
R28# 100
R29 27K
R30 150K
R31# 470K
R32# 330K
R33 22K
R34# 80K
R35# 68K
R36# 100K
R37 1K5
R38 100
R39 100
R40# 100
R41 100
C1 22p
C2# 22p
C3 100p
C4 100p
C6# 100p
C7# 100p
C11 100n
C12 100n
C13 100n
C14 100n
TR1 BC848B
TR2# BC858B
TR62# BC847C
TR63# BC858C
TR72# BC847B
TR54# 2XBC847B
TR55#
7CON
5CON
#=COMPONENTSIDE CLOSEST ML PLUG
226
225
R
L
C22
C23
C24
C25
-15V
2CON
1CON
L6 2µ2
L7 2µ2
C134# 47p
C160# 47p
C133# 47p
C132# 47p
R267 1K5
R320 1K5
R266 1K5
R265 1K5
L5 100µ
L8 100µ
L4 100µ
L3 100µ
DATA-
DATA +
+L1
-L1
+R1
-R1
P100
ML
C154# 220p
C155# 220p
C156# 220p
C157# 220p
C159# 10n
C158# 10n
D61# 8V2
D60# 8V2
D73
D72
D70#
D71#
D52#
R318# 3K3
R319 470
R317# 100
R314# 3K3
R315 470
R316# 100
R286# 10K
R285# 10K
C183# 820p
C182 220p
C150# 100n
R293# 10K
R292# 1K
R284# 3K9
R291# 5K6
R294# 220
R354# 150K
R352# 10K
R351# 1K
R350# 1K
R353# 22K
C290
C174# 100n
C180# 100n
IC20 PIN4
IC20 PIN11
8.5V-15V
-8.5V--15V
+8.5V-+15V
RX
P23-2
F161
ML CONNECT
P23-6
F165
ML SENSE

DIAGRAM B INPUT SELECT



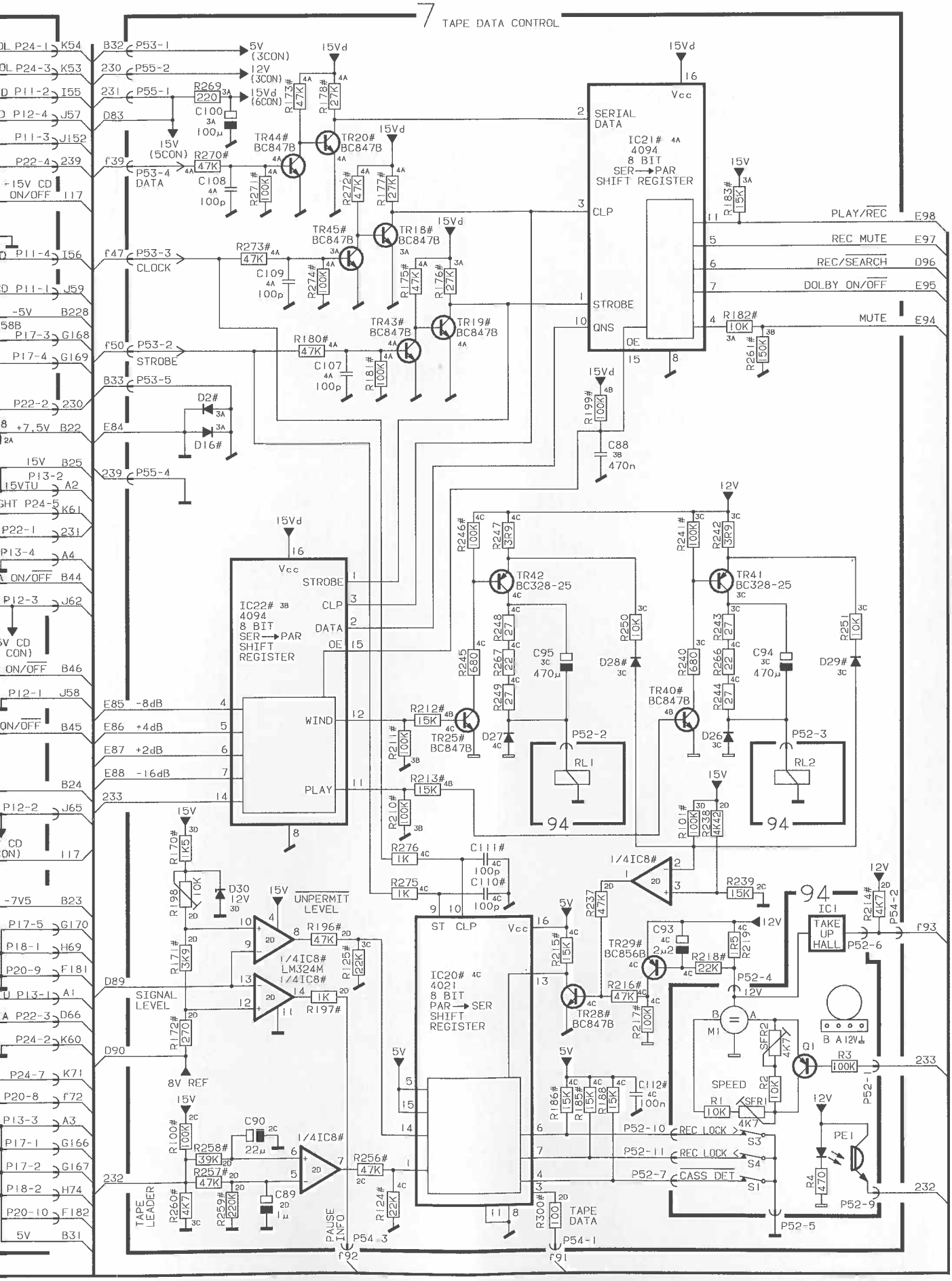
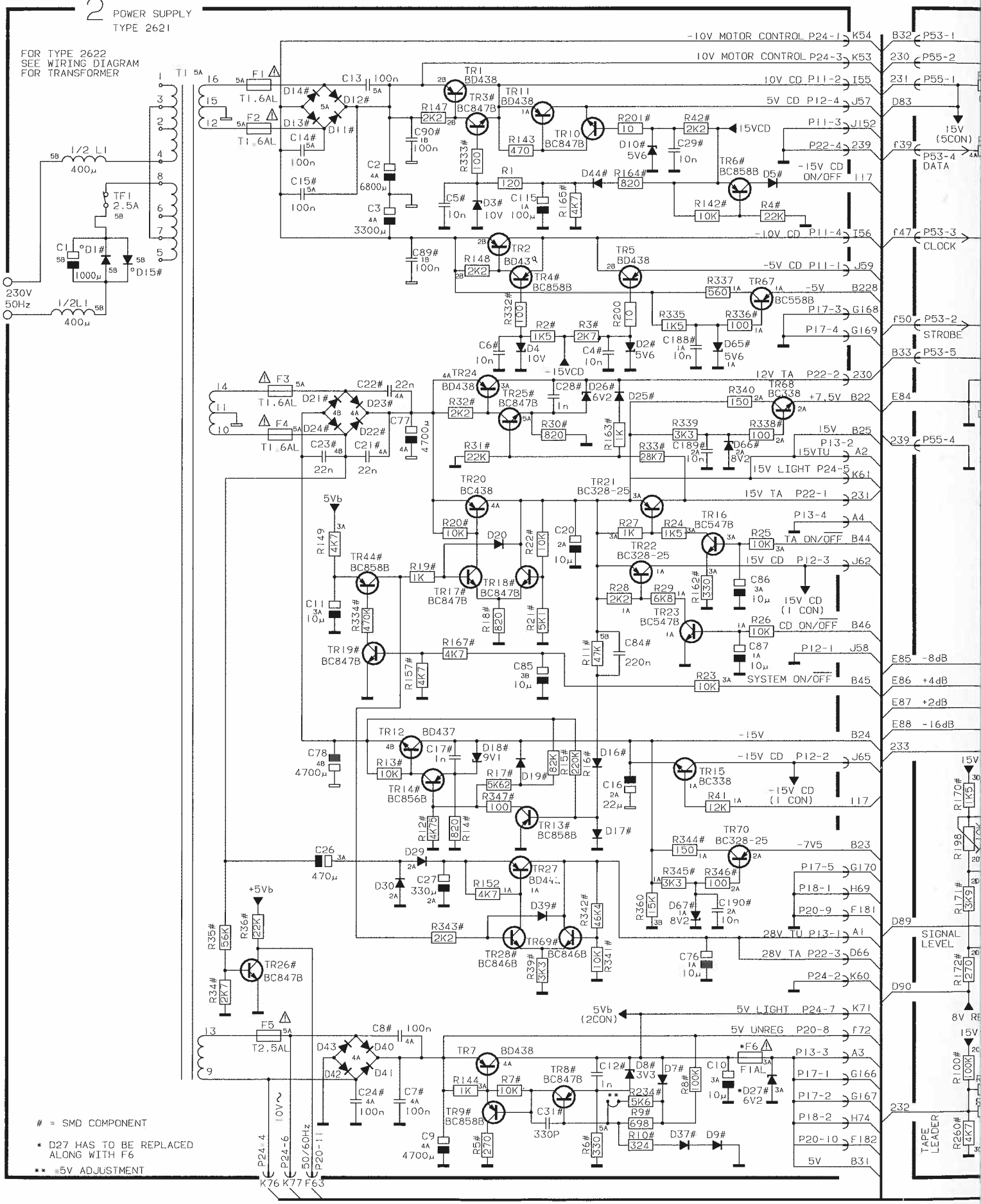

7 TAPE DATA CONTROL
IC21# 4094 8 BIT SER→PAR SHIFT REGISTER
SERIAL DATA
CLP
STROBE
QNS
OE
Vcc
PLAY/REC
REC MUTE
REC/SEARCH
DOLBY ON/OFF
MUTE
IC22# 4094 8 BIT SER→PAR SHIFT REGISTER
STROBE
CLP
DATA
OE
WIND
PLAY
IC20# 4021 8 BIT PAR→SER SHIFT REGISTER
ST CLP
TR42 BC328-25
TR41 BC328-25
TR40# BC847B
TR25# BC847B
TR28# BC847B
TR29# BC856B
TR44# BC847B
TR20# BC847B
TR45# BC847B
TR18# BC847B
TR43# BC847B
TR19# BC847B
RL1
RL2
P52-2
P52-3
P52-4
P52-5
P52-6
P52-7
P52-9
P52-10
P52-11
REC LOCK >
REC LOCK <
CASS DET
TAKE UP HALL
SPEED
SIGNAL LEVEL
UNPERMIT LEVEL
8V REF
TAPE LEADER
PAUSE INFO
TAPE DATA
5V (3CON)
12V (3CON)
15Vd (6CON)
15V (5CON)
P53-1
P55-2
P55-1
P53-4 DATA
P53-3 CLOCK
P53-2 STROBE
P53-5
P55-4
P54-1
P54-2
P54-3
E85 -8dB
E86 +4dB
E87 +2dB
E88 -16dB
D2#
D16#
D26
D27
D28#
D29#
D30
S1
S3
S4
M1
Q1
PE1
IC1

DIAGRAM C POWER SUPPLY/TAPE DATA CONTROL



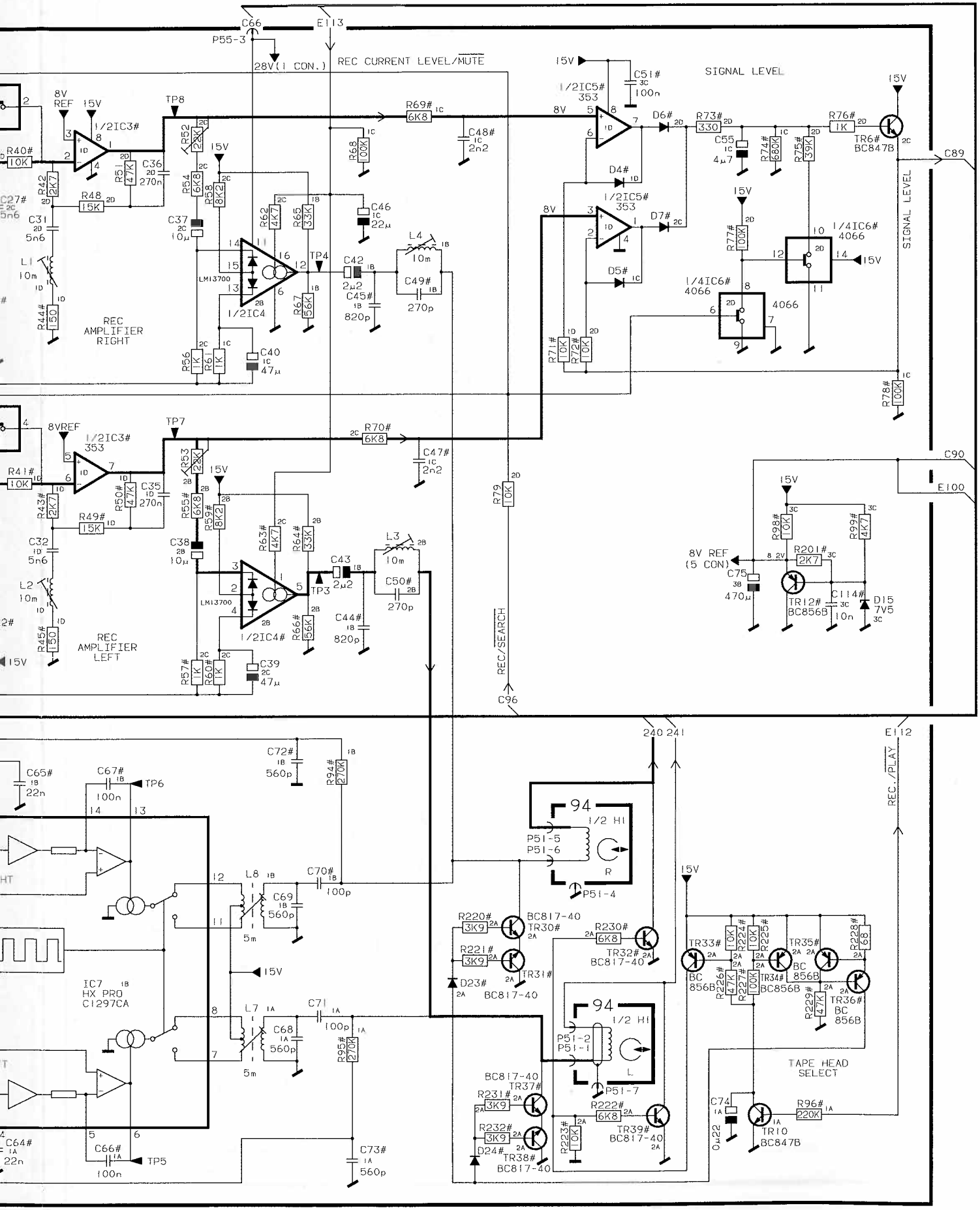
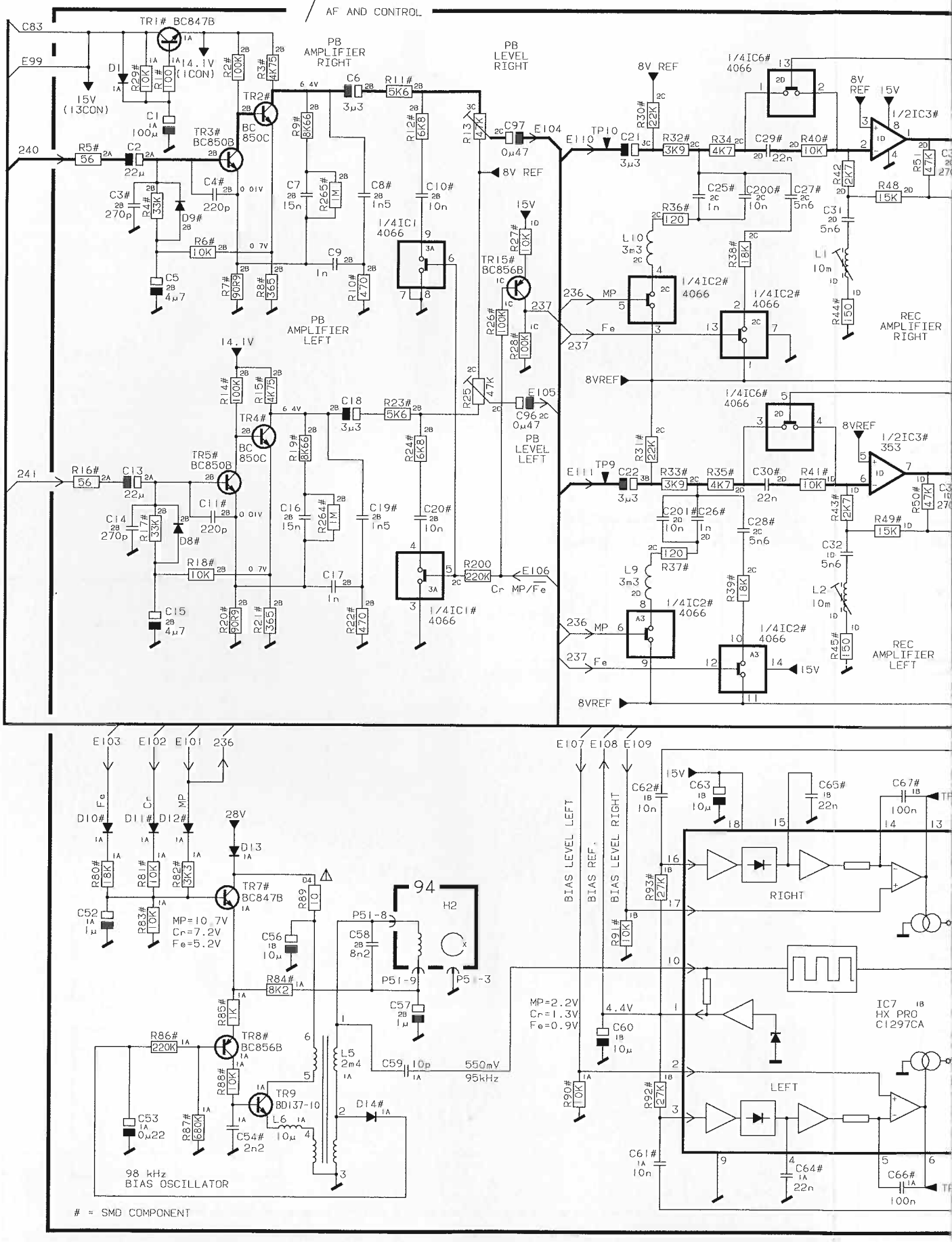

C66
E113
P55-3
28V(1 CON.)
REC CURRENT LEVEL/MUTE
SIGNAL LEVEL
8V REF
15V
1/2IC3#
TP8
R69# 6K8
C48# 2n2
R40# 10K
R42 2K7
R51 4K7
C36 270n
R52 22K
R54 6K8
R58 8K2
R48 15K
C31 5n6
L1 10m
R44# 150
REC AMPLIFIER RIGHT
R62 4K7
R65 33K
C37 10µ
C46 22µ
L4 10m
C49# 270p
TP4
C42 2µ2
C45# 820p
R67 56K
1/2IC4
LM13700
R56 1K
R61 1K
C40 47µ
R68 100K
1/2IC5# 353
C51# 100n
D6#
D4#
D5#
D7#
R73# 330
C55 4µ7
R74# 680K
R75# 39K
R76# 1K
TR6# BC847B
C89
R77# 10K
1/4IC6# 4066
R71# 10K
R72# 10K
R78# 100K
8VREF
TP7
R70# 6K8
C47# 2n2
R41# 10K
R43 2K7
R50# 4.7K
C35 270n
R53 22K
R55# 6K8
R59# 8K2
R49# 15K
C32 5n6
L2 10m
R45# 150
C38 10µ
R63# 4K7
R64# 33K
C43 2µ2
L3 10m
C50# 270p
TP3
C44# 820p
R66# 56K
1/2IC4#
REC AMPLIFIER LEFT
R57# 1K
R60# 1K
C39 47µ
R79 10K
REC/SEARCH
C96
C90
E100
R98# 10K
R99# 4K7
8V REF (5 CON)
R201# 2K7
C75 470µ
TR12# BC856B
C114# 10n
D15 7V5
C65# 22n
C67# 100n
TP6
C72# 560p
R94# 270K
L8
C69 560p
5m
C70# 100p
IC7 HX PRO C1297CA
L7
C68 560p
C71 100p
R95# 270K
C64# 22n
C66# 100n
TP5
C73# 560p
240 241
E112
REC./PLAY
94 1/2 HI
P51-5
P51-6
P51-4
R
R220# 3K9
TR30# BC817-40
R221# 3K9
TR31# BC817-40
D23# BC817-40
R230# 6K8
TR32# BC817-40
94 1/2 HI
P51-2
P51-1
P51-7
L
R231# 3K9
TR37# BC817-40
R232# 3K9
D24# TR38# BC817-40
R222# 6K8
TR39# BC817-40
R223# 10K
TR33# BC 856B
R226# 4K7
R224# 10K
R225# 10K
R227# 100K
TR34# BC856B
TR35# BC 856B
R228# 68
R229# 4K7
TR36# BC 856B
TAPE HEAD SELECT
C74 0µ22
R96# 220K
TR10 BC847B

DIAGRAM D TAPE AF AND CONTROL



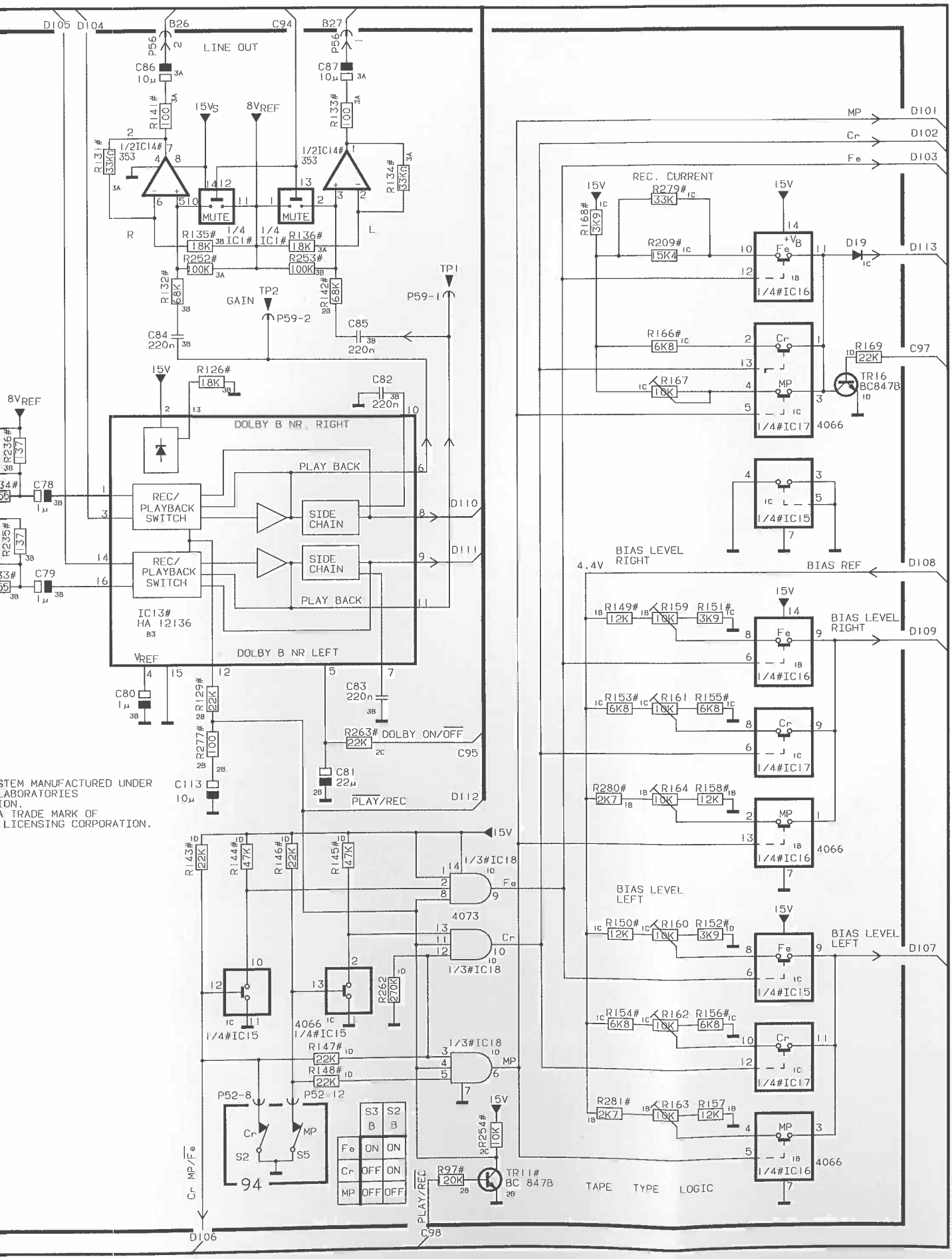
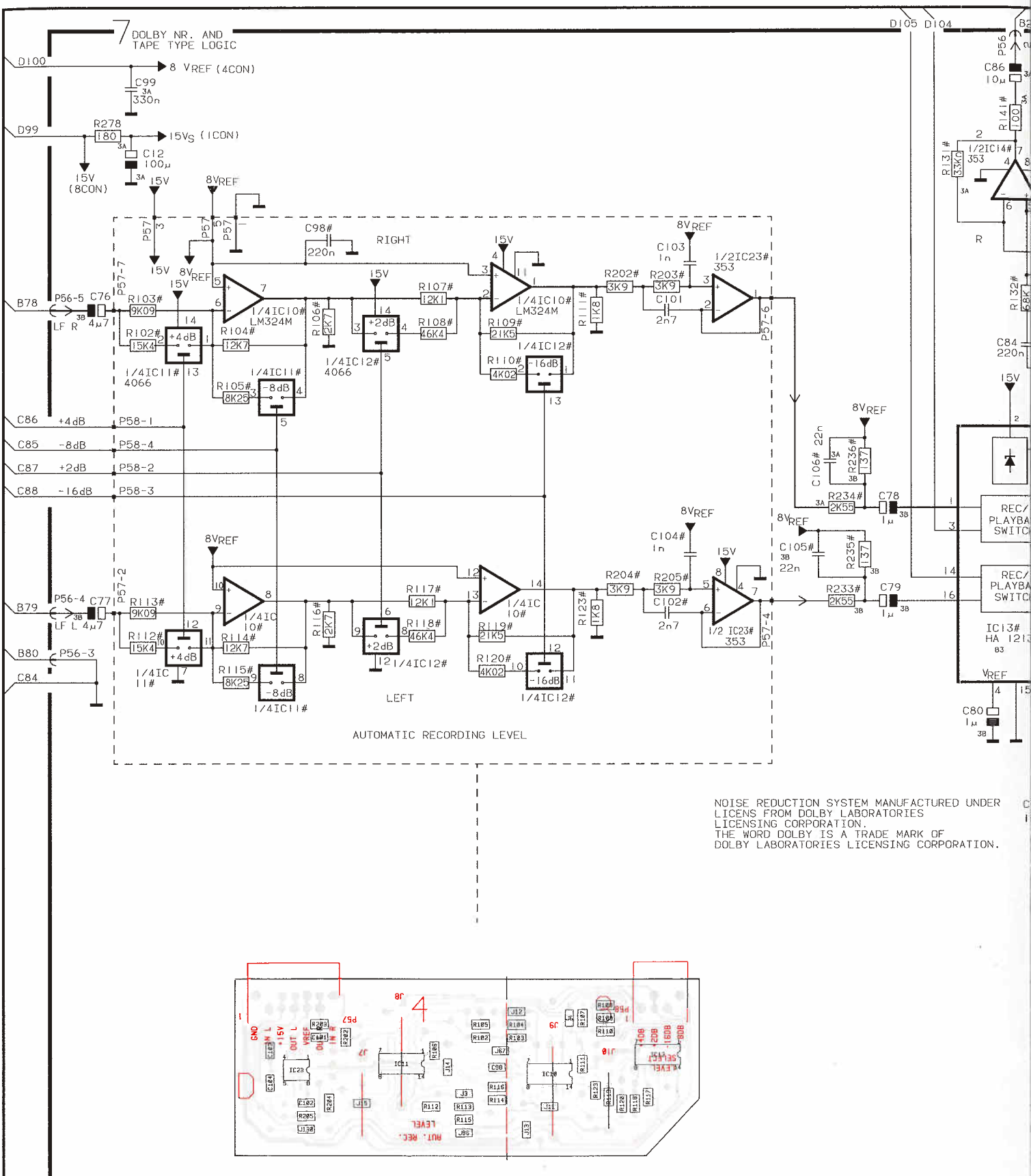

LINE OUT
MUTE
MUTE
GAIN
DOLBY B NR RIGHT
DOLBY B NR LEFT
PLAY BACK
REC/ PLAYBACK SWITCH
SIDE CHAIN
IC13# HA 12136
DOLBY ON/OFF
PLAY/REC
REC. CURRENT
BIAS LEVEL RIGHT
BIAS LEVEL LEFT
BIAS REF
4.4V
TAPE TYPE LOGIC
TR11# BC 847B
TR16 BC847B
4066
4073
S3 B
S2 B
Fe ON ON
Cr OFF ON
MP OFF OFF
STEM MANUFACTURED UNDER
LABORATORIES
ION.
A TRADE MARK OF
LICENSING CORPORATION.

DIAGRAM E DOLBY NR AND TYPE LOGIC



NOISE REDUCTION SYSTEM MANUFACTURED UNDER LICENS FROM DOLBY LABORATORIES LICENSING CORPORATION.
THE WORD DOLBY IS A TRADE MARK OF DOLBY LABORATORIES LICENSING CORPORATION.

= SMD COMPONENT

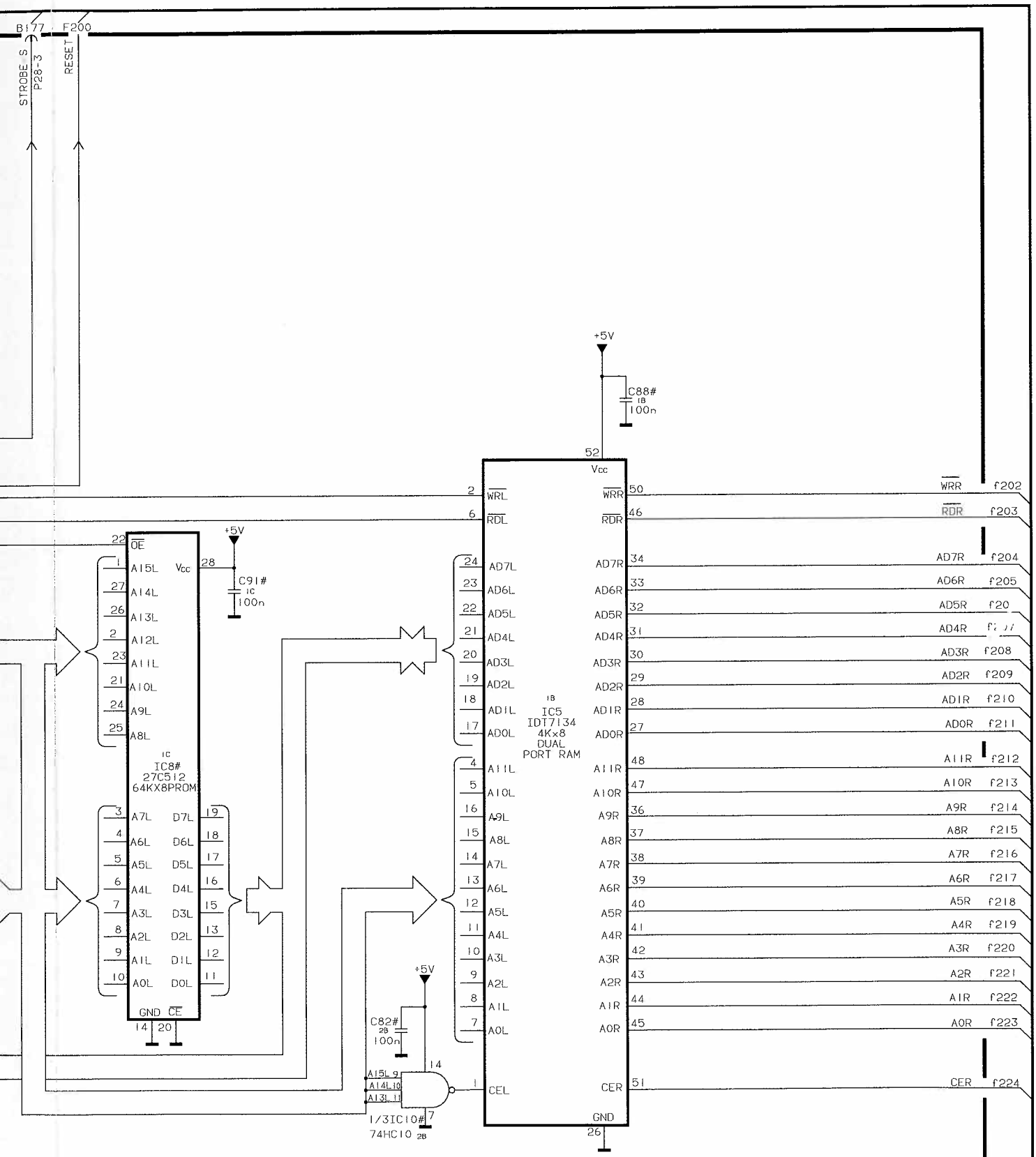
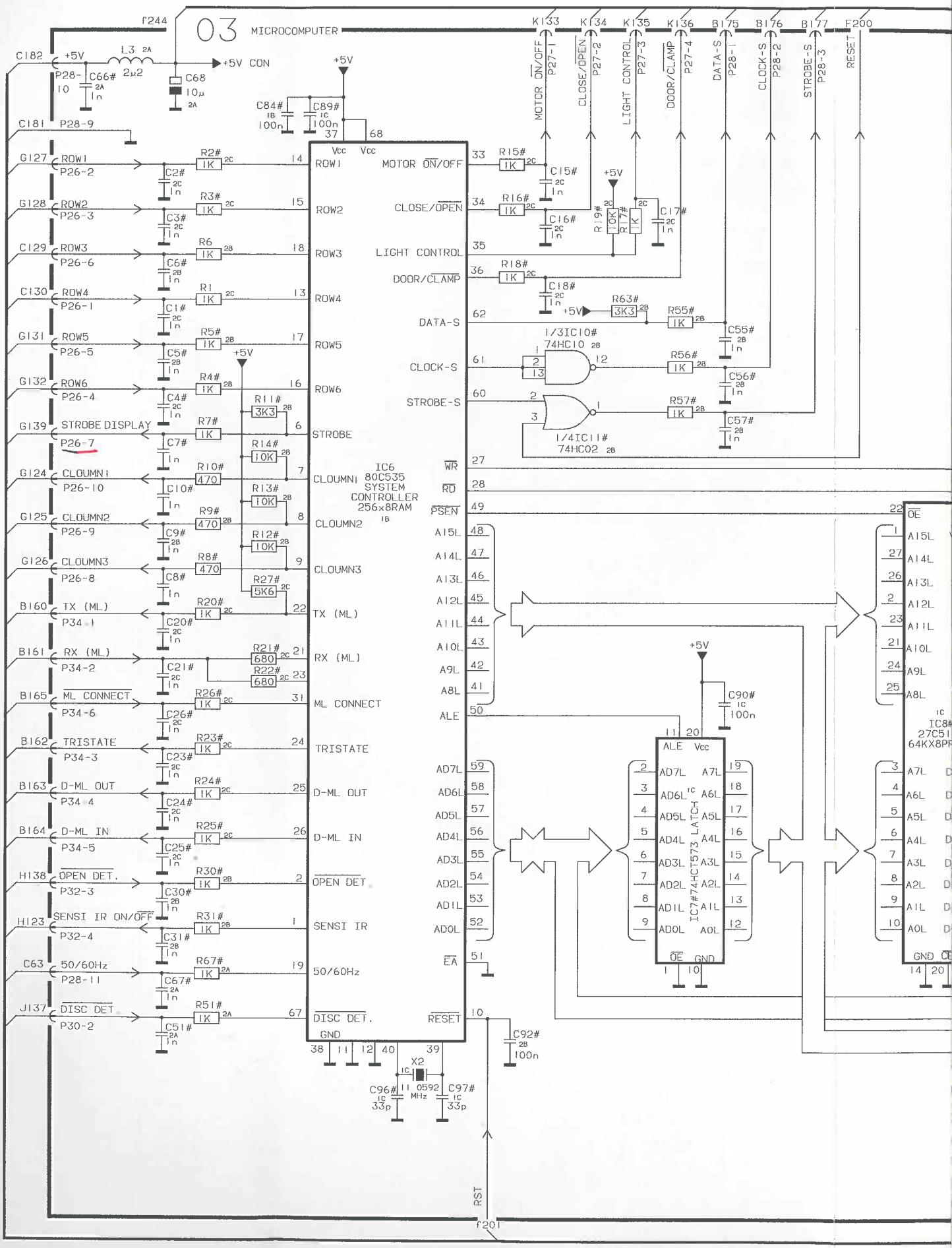

B177
F200
STROBE_S
P28-3
RESET
+5V
C88#
1B
100n
52
Vcc
2
WRL
6
RDL
WRR
50
RDR
46
WRR f202
RDR f203
IC5
IDT7134
4Kx8
DUAL
PORT RAM
AD7L
AD6L
AD5L
AD4L
AD3L
AD2L
AD1L
AD0L
AD7R
AD6R
AD5R
AD4R
AD3R
AD2R
AD1R
AD0R
34
33
32
31
30
29
28
27
AD7R f204
AD6R f205
AD5R f20
AD4R f2
AD3R f208
AD2R f209
AD1R f210
AD0R f211
A11L
A10L
A9L
A8L
A7L
A6L
A5L
A4L
A3L
A2L
A1L
A0L
A11R
A10R
A9R
A8R
A7R
A6R
A5R
A4R
A3R
A2R
A1R
A0R
48
47
36
37
38
39
40
41
42
43
44
45
A11R f212
A10R f213
A9R f214
A8R f215
A7R f216
A6R f217
A5R f218
A4R f219
A3R f220
A2R f221
A1R f222
A0R f223
CEL
CER
1
51
CER f224
GND
26
IC
IC8#
27C512
64KX8PROM
22
OE
A15L
A14L
A13L
A12L
A11L
A10L
A9L
A8L
Vcc
28
C91#
1C
100n
A7L
A6L
A5L
A4L
A3L
A2L
A1L
A0L
D7L
D6L
D5L
D4L
D3L
D2L
D1L
D0L
GND
CE
14
20
C82#
2B
100n
A15L 9
A14L 10
A13L 11
14
7
1/3IC10#
74HC10
2B

DIAGRAM F MICROCOMPUTER



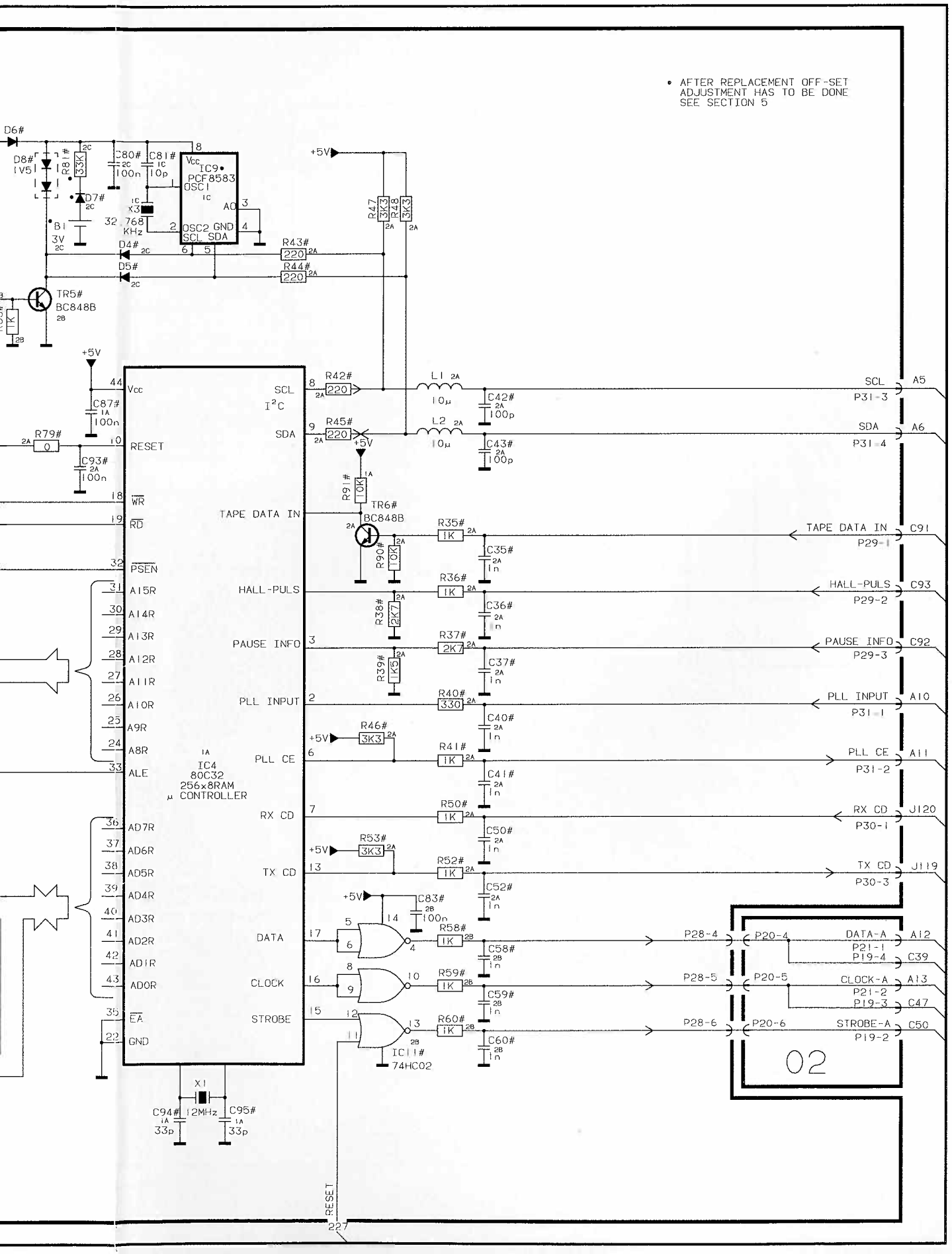
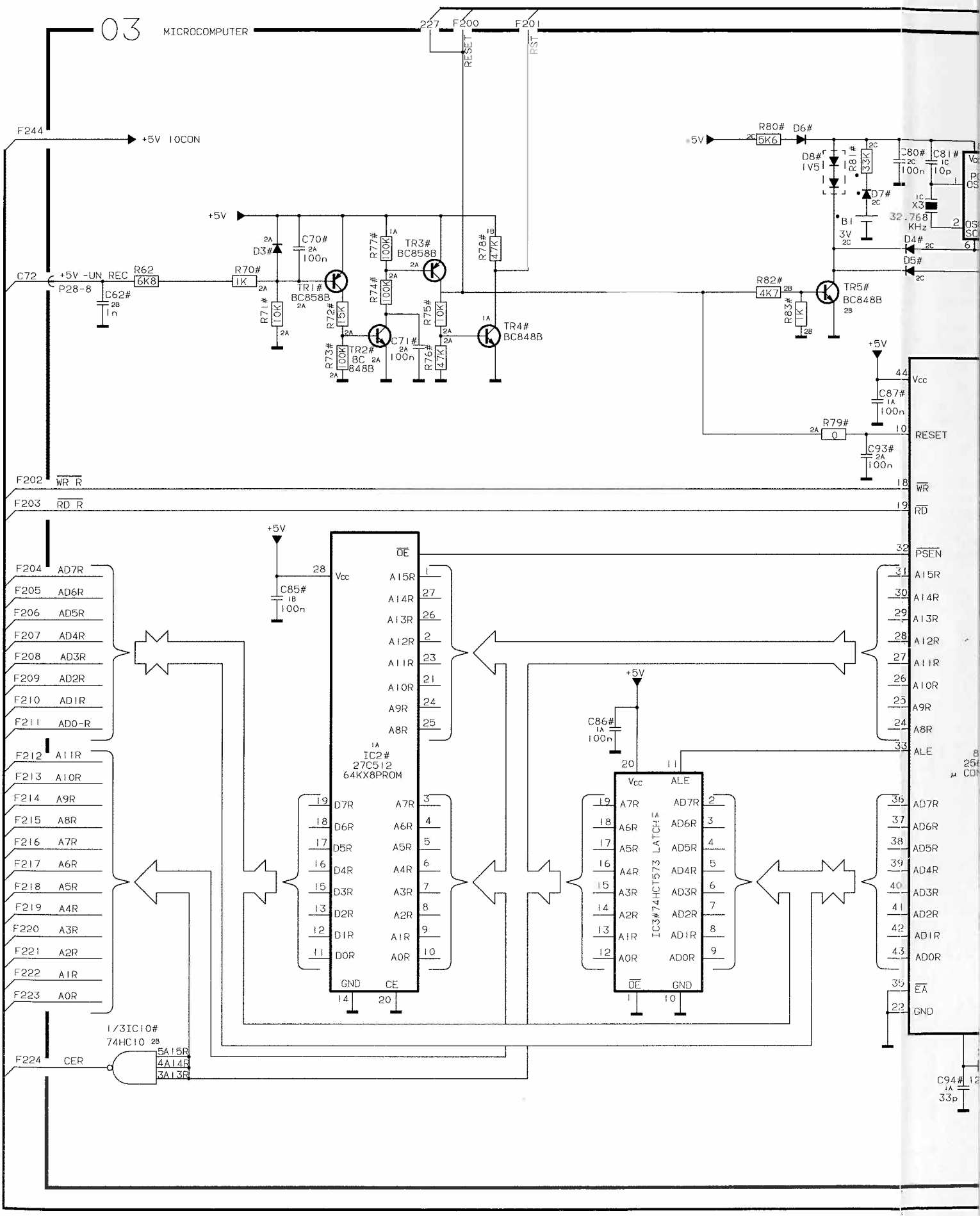

• AFTER REPLACEMENT OFF-SET ADJUSTMENT HAS TO BE DONE SEE SECTION 5
IC4 80C32 256x8RAM µ CONTROLLER
IC9 PCF8583
TR5# BC848B
TR6# BC848B
IC11# 74HC02
SCL
SDA
TAPE DATA IN
HALL-PULS
PAUSE INFO
PLL INPUT
PLL CE
RX CD
TX CD
DATA
CLOCK
STROBE
RESET
P28-4
P28-5
P28-6
P20-4
P20-5
P20-6
DATA-A
CLOCK-A
STROBE-A
02

DIAGRAM f MICROCOMPUTER



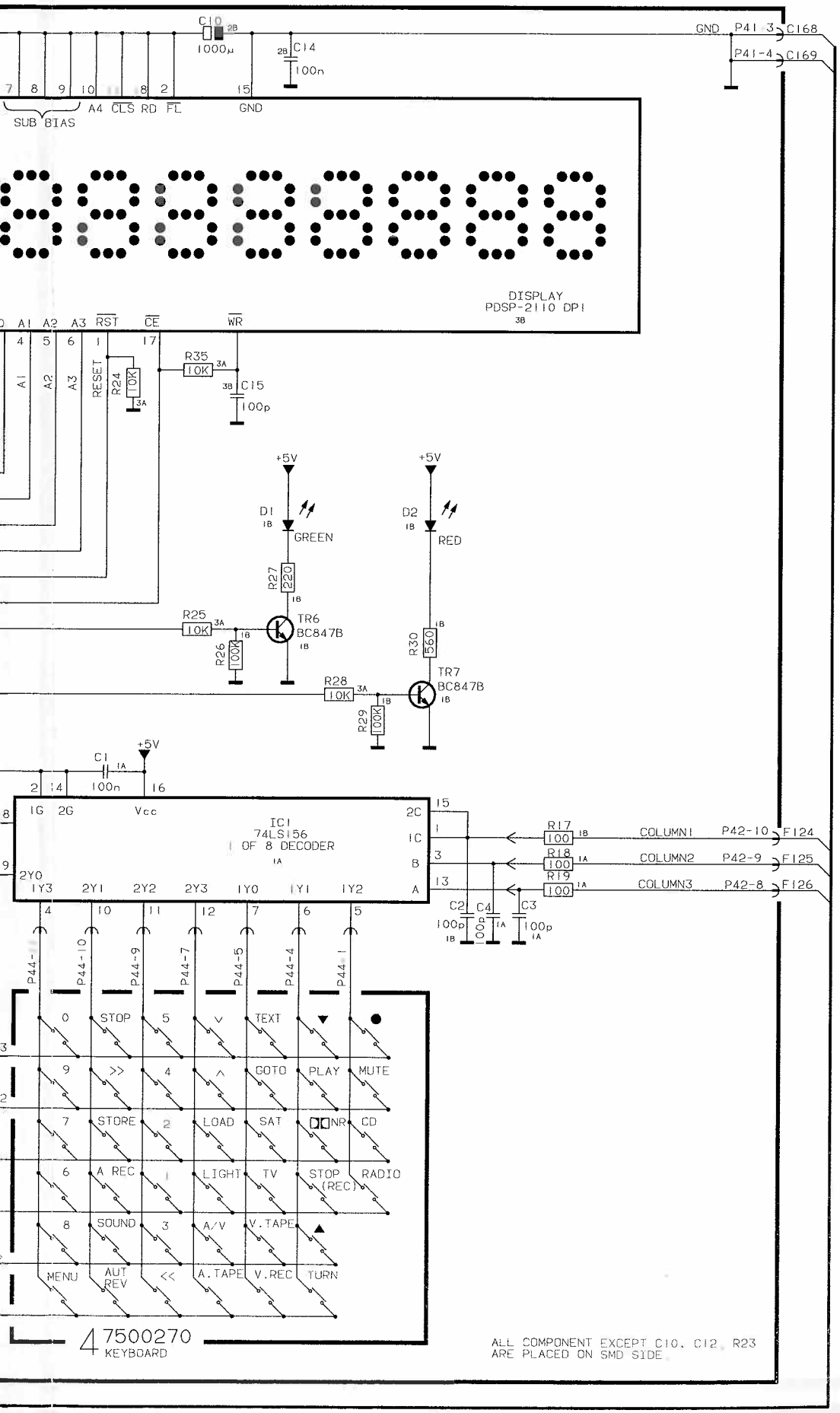
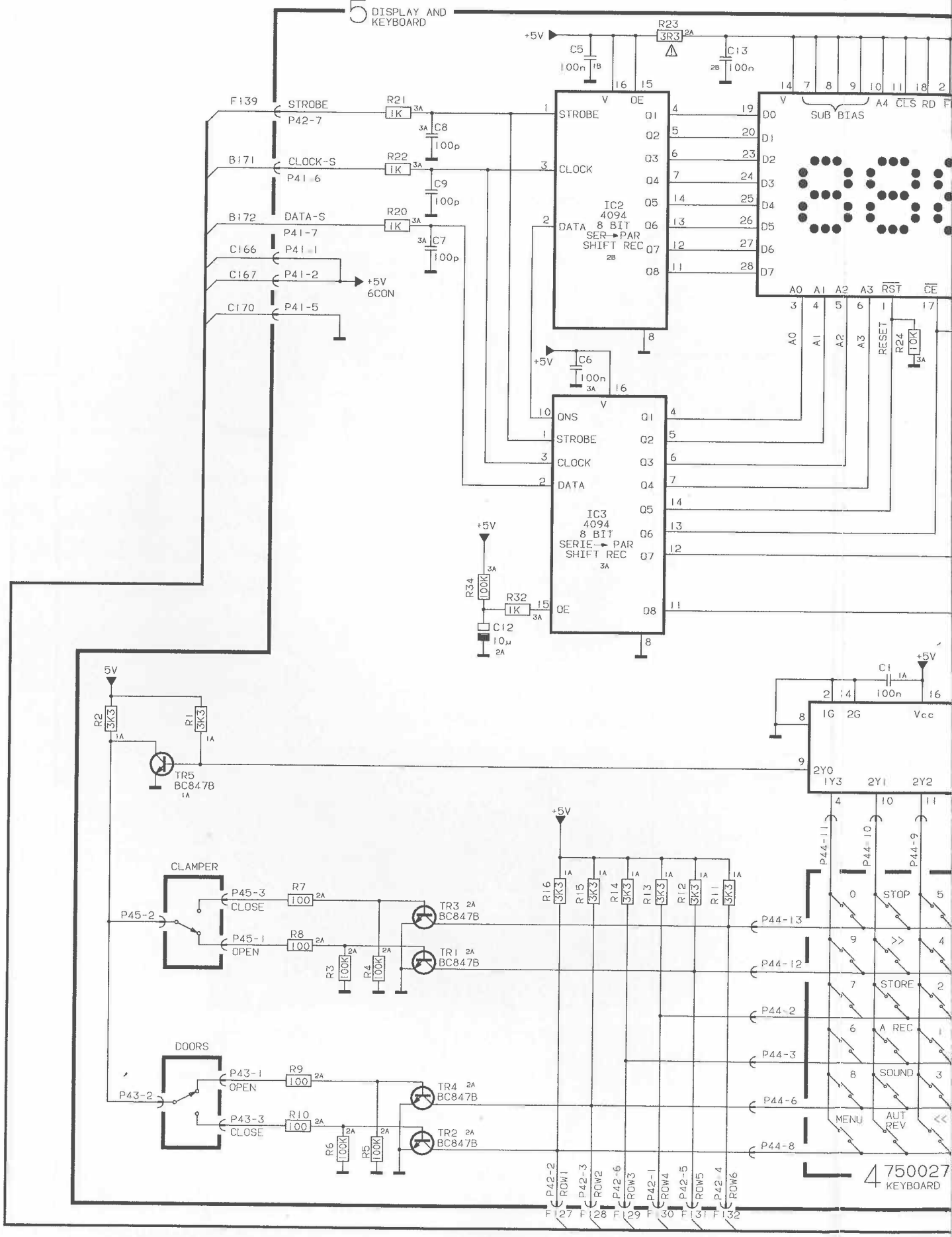
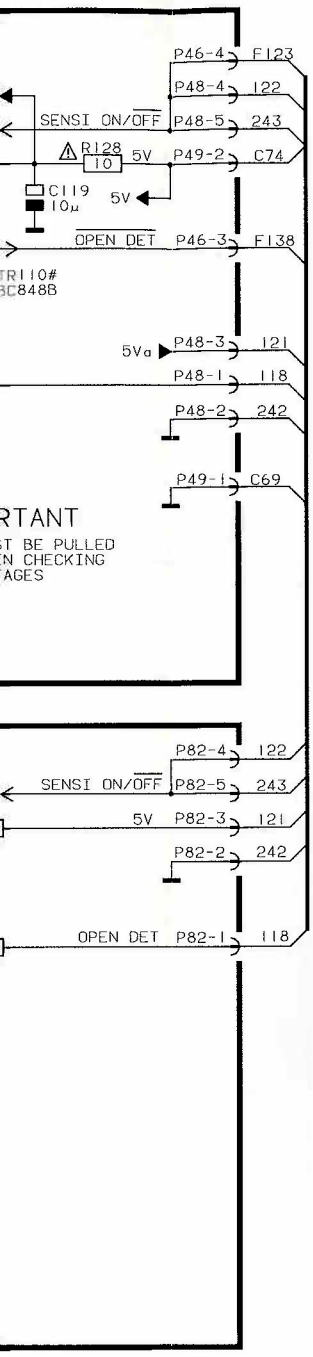
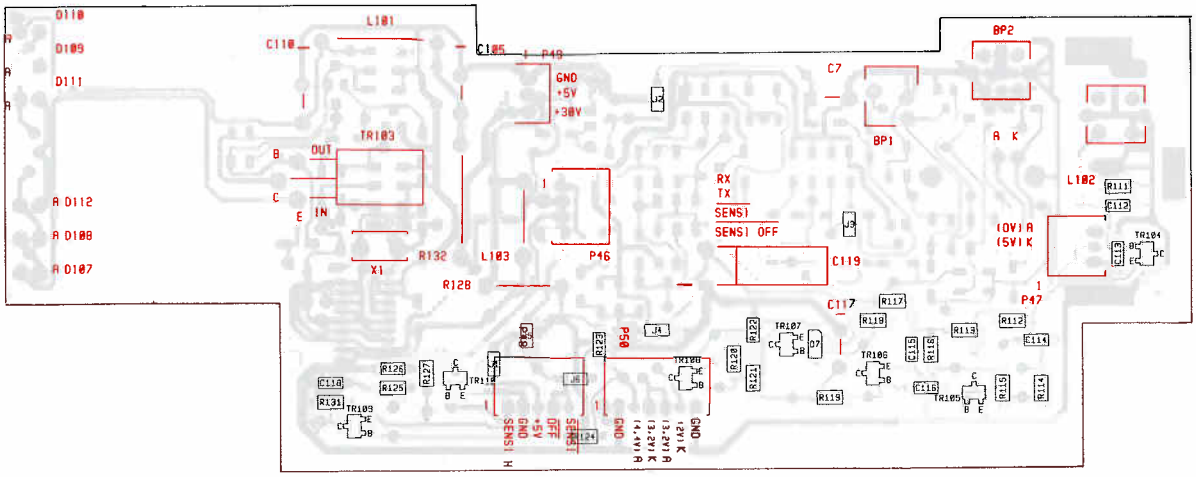

C10
2B
1000µ
2B C14
100n
GND
P41-3
C168
P41-4
C169
7 8 9 10 8 2 15
A4 CLS RD FL GND
SUB BIAS
DISPLAY
PDSP-2110 DP1
3B
A1 A2 A3 RST CE WR
4 5 6 1 17
A1
A2
A3
RESET
R24 10K 3A
R35 10K 3A
3B C15
100p
+5V
D1
1B
GREEN
D2
1B
RED
R27 220
1B
R25 10K 3A
R26 100K 1B
TR6
BC847B
1B
R30 560 1B
TR7
BC847B
1B
R28 10K 3A
R29 100K 1B
+5V
C1 1A
100n
2 14 16
IC1
74LS156
OF 8 DECODER
1A
1G 2G Vcc
2C 1C B A
15 1 3 13
2Y0 1Y3 2Y1 2Y2 2Y3 1Y0 1Y1 1Y2
4 10 11 12 7 6 5
P44-11 P44-10 P44-9 P44-7 P44-5 P44-4 P44-1
R17 100 1B COLUMN1 P42-10 F124
R18 100 1A COLUMN2 P42-9 F125
R19 100 1A COLUMN3 P42-8 F126
C2 100p 1B
C4 100p 1A
C3 100p 1A
0 STOP 5 V TEXT
9 >> 4 ^ GOTO PLAY MUTE
7 STORE 2 LOAD SAT NR CD
6 A REC 1 LIGHT TV STOP (REC) RADIO
8 SOUND 3 A/V V.TAPE
MENU AUT REV << A.TAPE V.REC TURN
4 7500270
KEYBOARD
ALL COMPONENT EXCEPT C10, C12, R23
ARE PLACED ON SMD SIDE.

DIAGRAM G DISPLAY AND KEYBOARD



PCB6, Door Sensor





PCB 11, Right door sensor

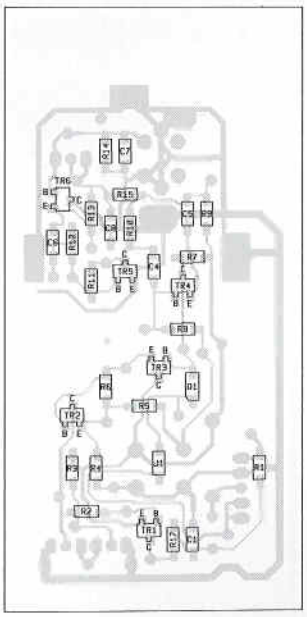
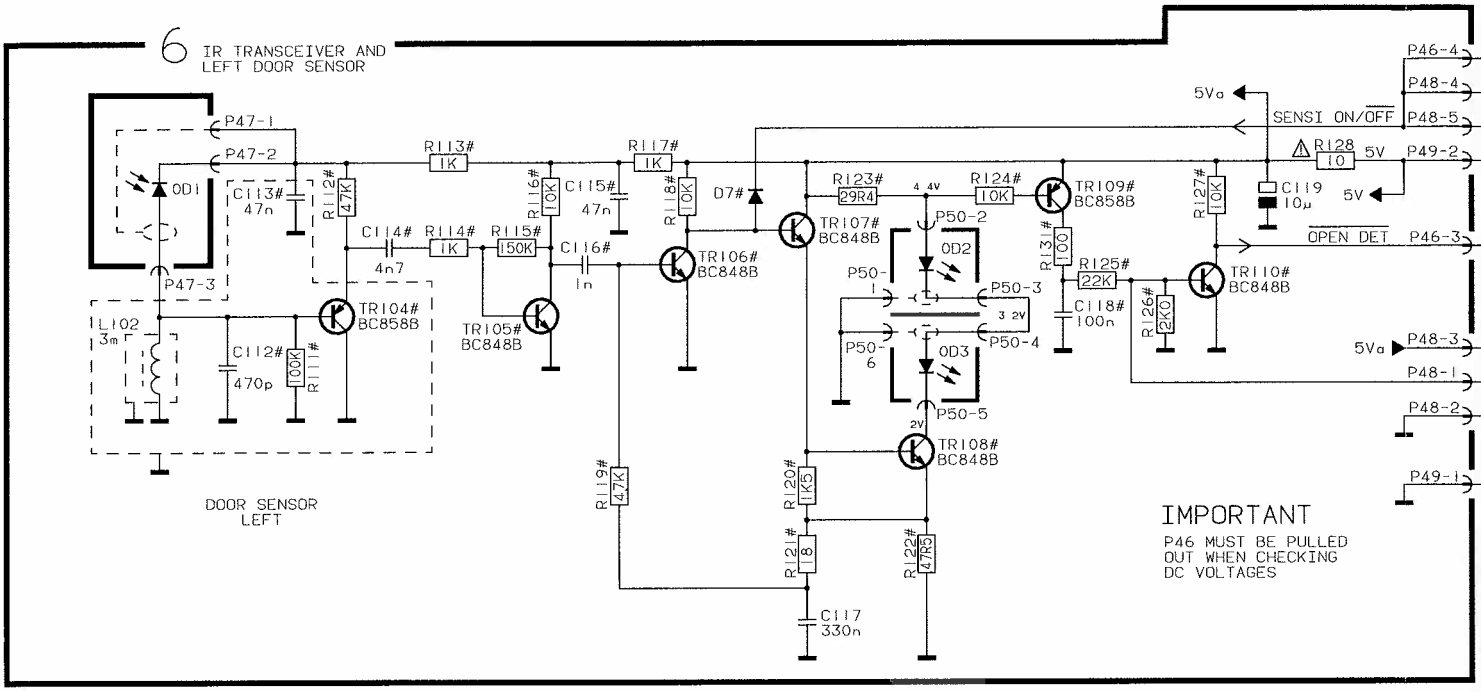
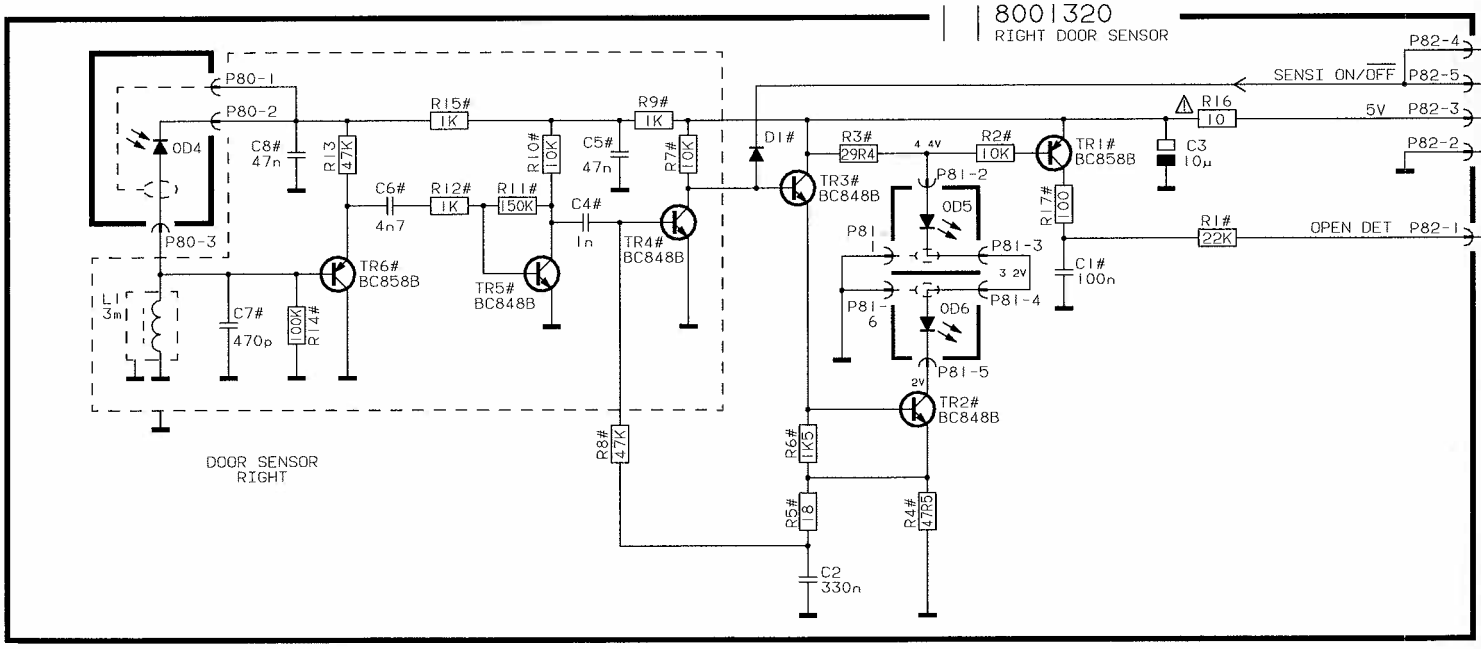


DIAGRAM H DOOR SENSOR





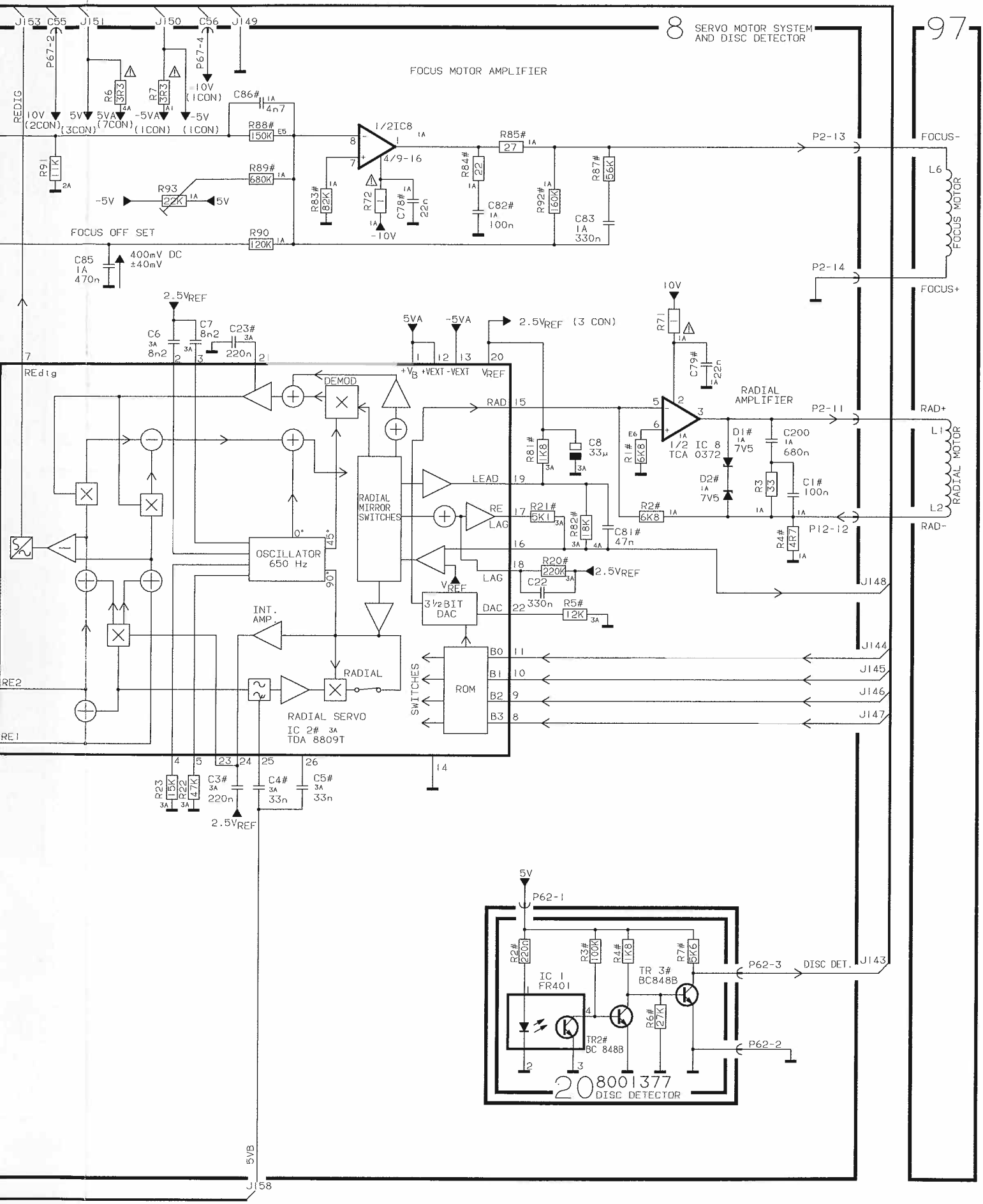
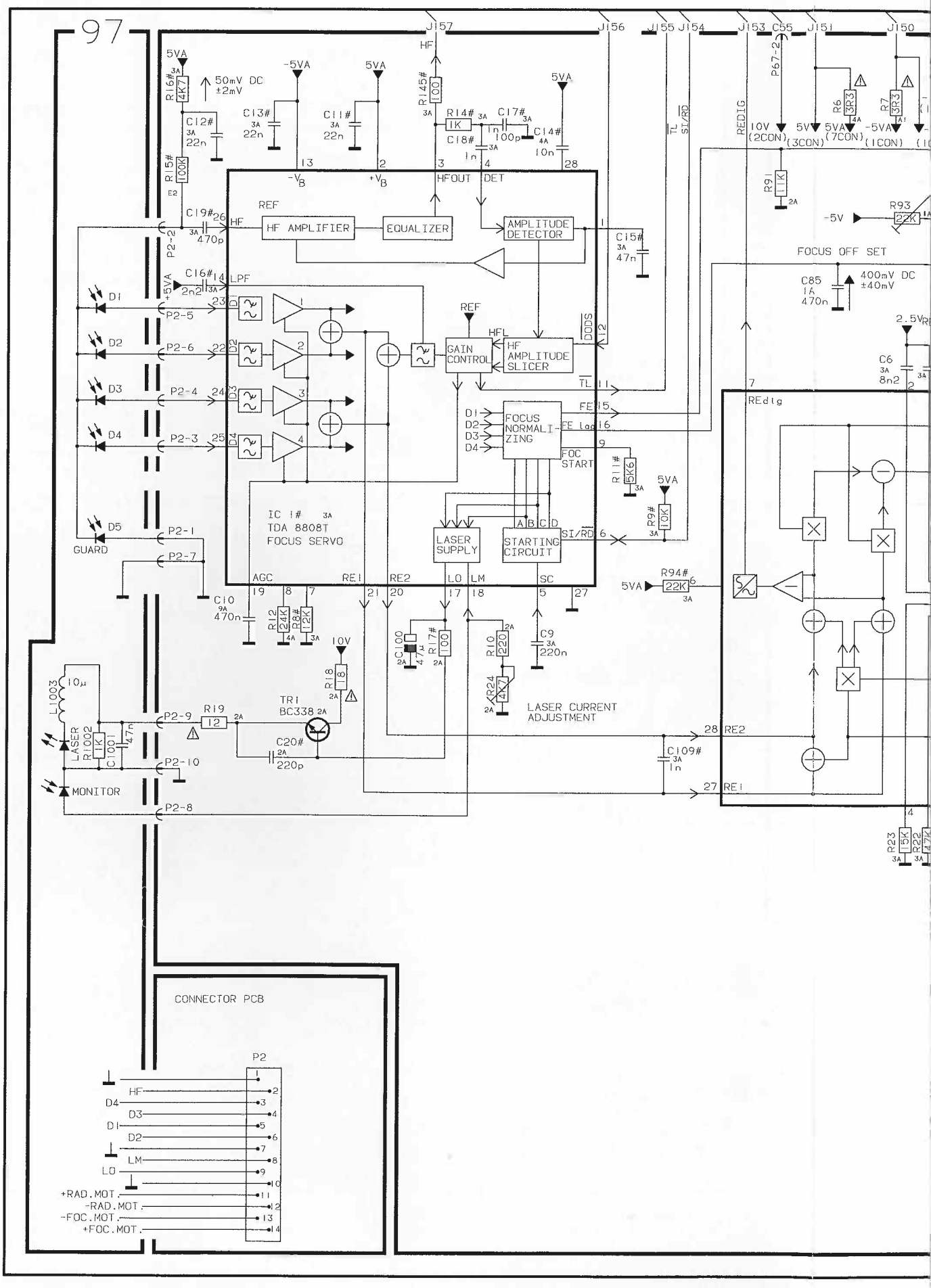

8 SERVO MOTOR SYSTEM AND DISC DETECTOR
97
FOCUS MOTOR AMPLIFIER
J153 C55 J151 J150 C56 J149
P67-2
P67-4
REDIG
10V (2CON)
5V (3CON)
5VA (7CON)
-5VA (1CON)
-5V (1CON)
10V (1CON)
R6 3R3
R7 3R3
C86# 4n7
R88# 150K
R89# 680K
R93 22K
-5V
5V
FOCUS OFF SET
R90 120K
C85 470n
400mV DC ±40mV
1/2IC8
4/9-16
R83# 82K
R72 1
C78# 22n
-10V
R84# 22
C82# 100n
R85# 27
R92# 160K
R87# 56K
C83 330n
P2-13
FOCUS-
L6
FOCUS MOTOR
P2-14
FOCUS+
R91 11K
2.5VREF
C6 8n2
C7 8n2
C23# 220n
5VA
-5VA
2.5VREF (3 CON)
+VB +VEXT -VEXT VREF
10V
R71 1
C79# 22n
RADIAL AMPLIFIER
I/2 IC 8 TCA 0372
D1# 7V5
D2# 7V5
C200 680n
R3 33
C1# 100n
R1# 6K8
R2# 6K8
R4# 4R7
P2-11
P12-12
RAD+
RAD-
L1
L2
RADIAL MOTOR
REdtg
DEMOD
RAD
LEAD
RE
LAG
LAG
VREF
DAC
R81# 1K8
C8 33µ
R21# 5K1
R82# 18K
C81# 47n
R20# 220K
C22 330n
R5# 12K
2.5VREF
RADIAL MIRROR SWITCHES
OSCILLATOR 650 Hz
0°
45°
90°
INT. AMP.
RADIAL
RADIAL SERVO
IC 2# 3A
TDA 8809T
3½BIT DAC
SWITCHES
ROM
B0
B1
B2
B3
J148
J144
J145
J146
J147
R23 15K
R22 47K
C3# 220n
C4# 33n
C5# 33n
2.5VREF
5VB
J158
5V
P62-1
R2# 220n
R3# 100K
R4# 1K8
R7# 5K6
IC 1 FR401
TR 3# BC848B
R6# 27K
TR2# BC 848B
P62-3
DISC DET.
J143
P62-2
20 8001377
DISC DETECTOR

DIAGRAM I CD SERVO MOTOR SYSTEM AND DISC DETECTOR



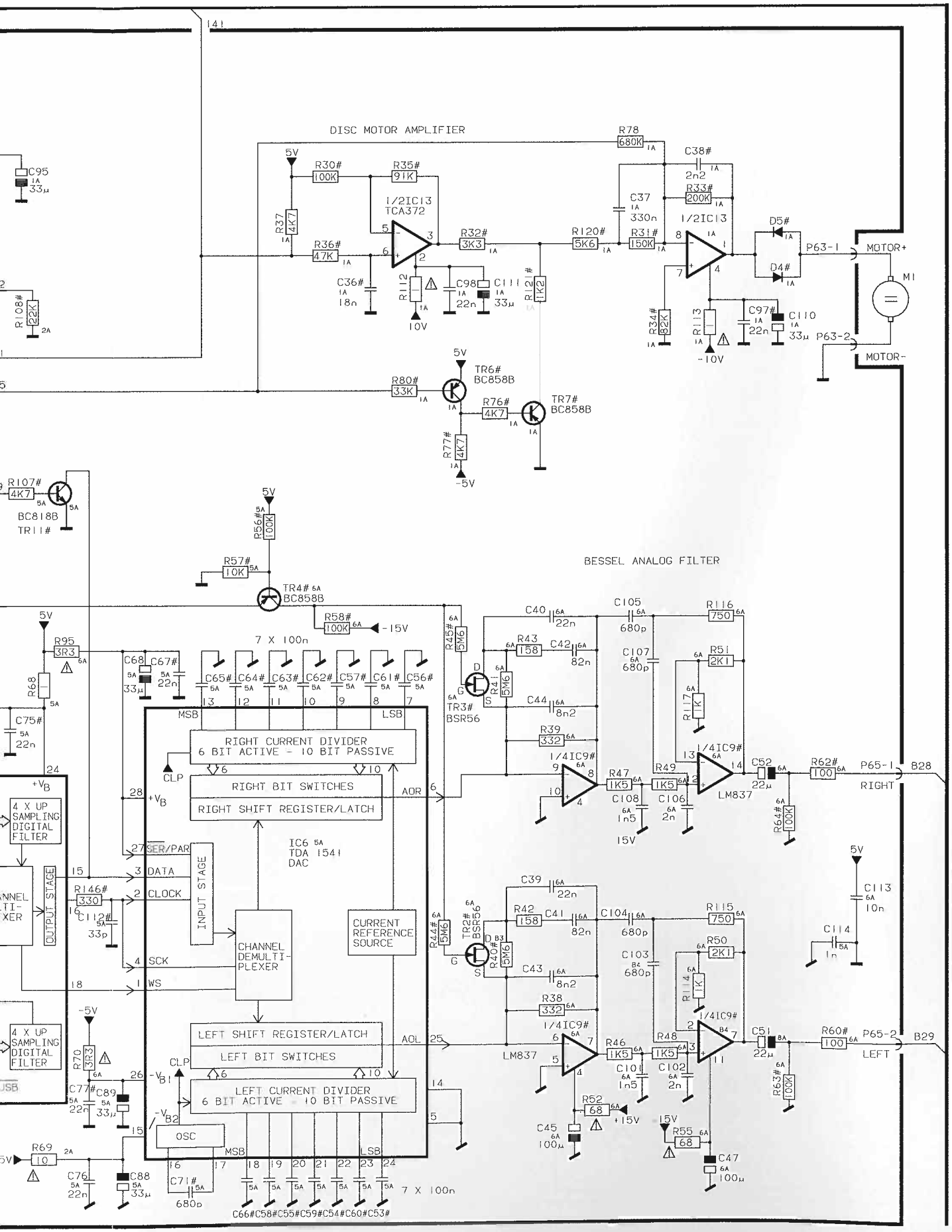
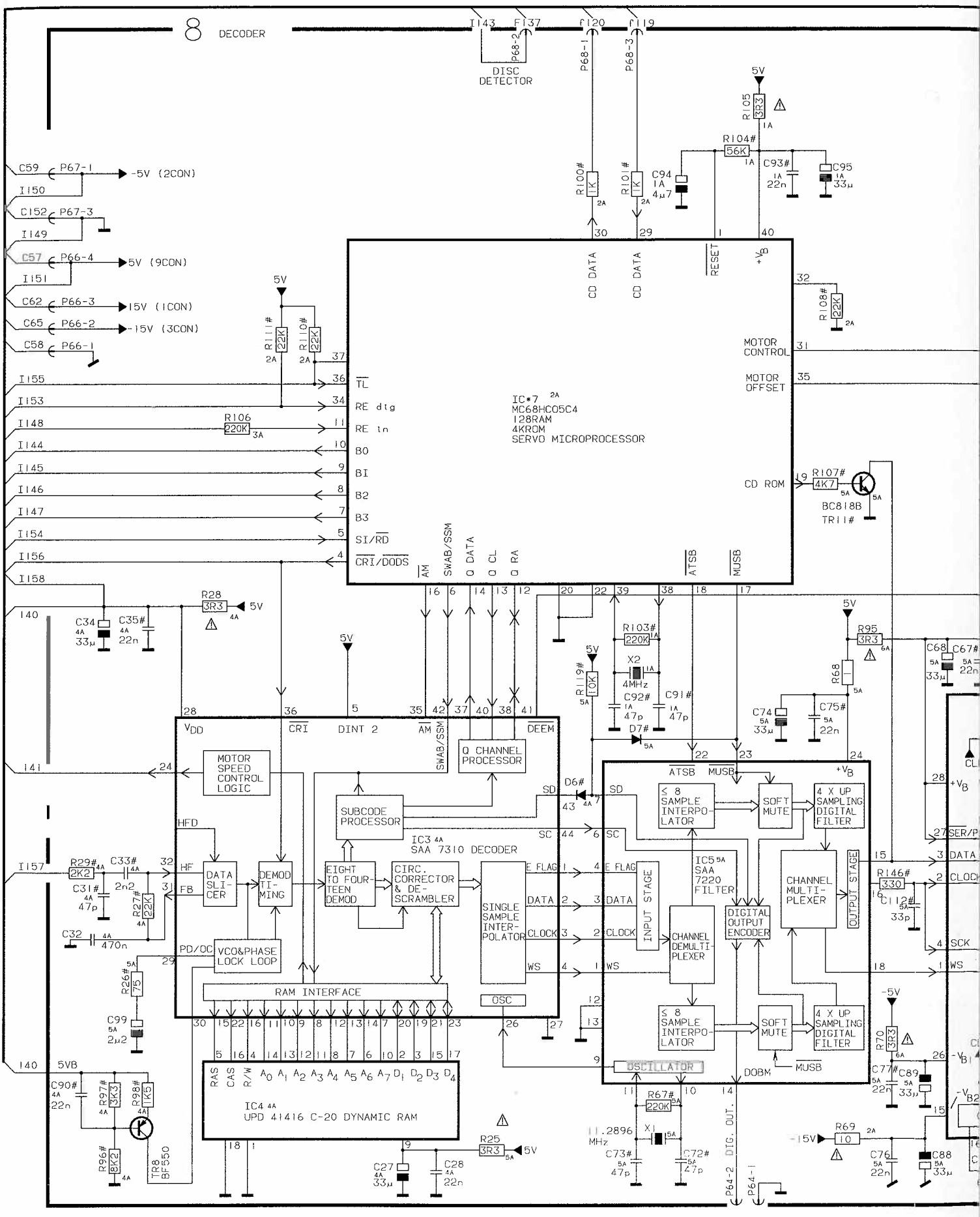
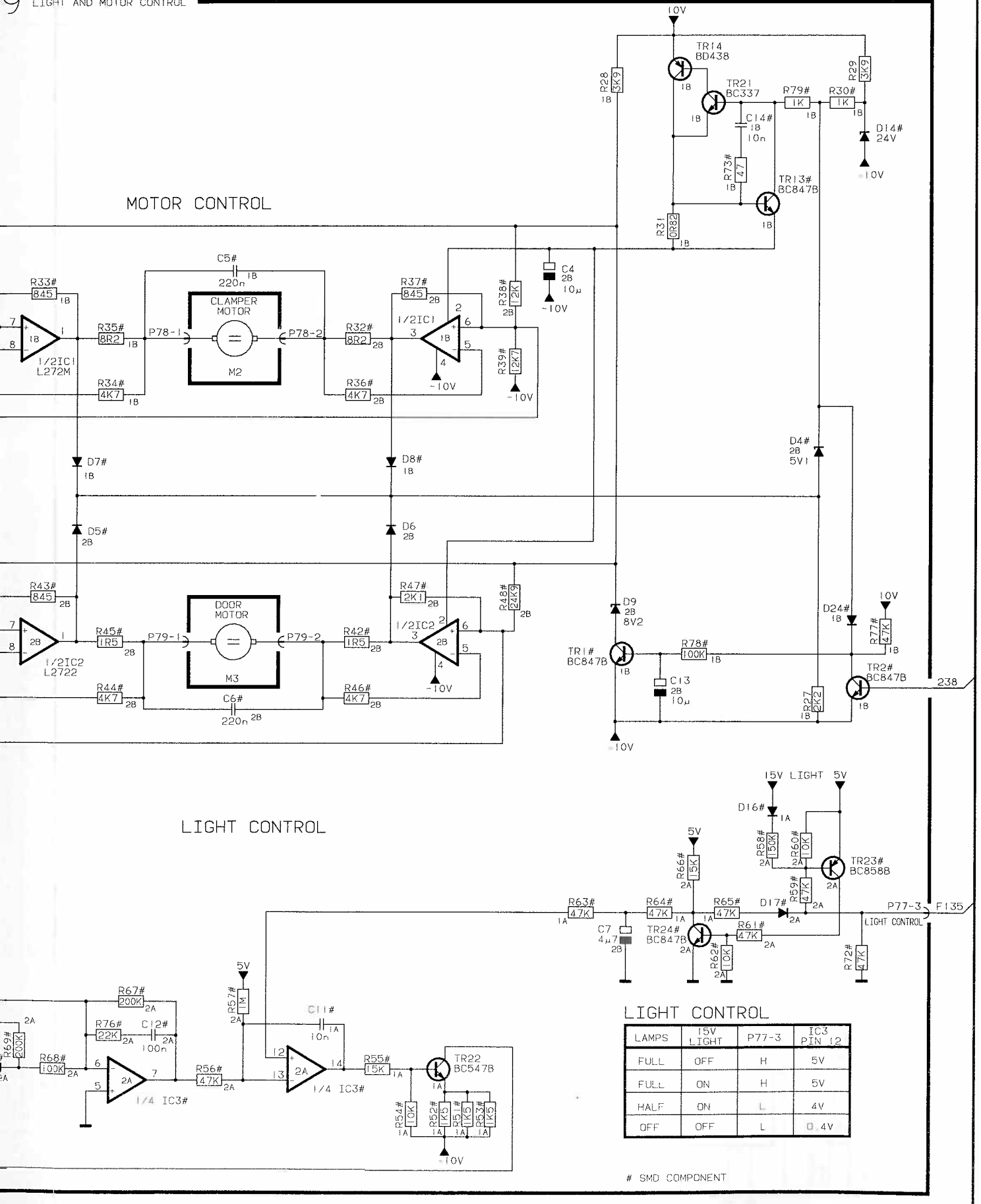

DISC MOTOR AMPLIFIER
BESSEL ANALOG FILTER
RIGHT CURRENT DIVIDER
6 BIT ACTIVE - 10 BIT PASSIVE
RIGHT BIT SWITCHES
RIGHT SHIFT REGISTER/LATCH
LEFT SHIFT REGISTER/LATCH
LEFT BIT SWITCHES
LEFT CURRENT DIVIDER
6 BIT ACTIVE - 10 BIT PASSIVE
IC6 TDA 1541 DAC
INPUT STAGE
CHANNEL DEMULTI-PLEXER
CURRENT REFERENCE SOURCE
OSC
4 X UP SAMPLING DIGITAL FILTER
OUTPUT STAGE
LM837
MOTOR+
MOTOR-
RIGHT
LEFT
MSB
LSB
7 X 100n

DIAGRAM J CD DECODER



9 LIGHT AND MOTOR CONTROL

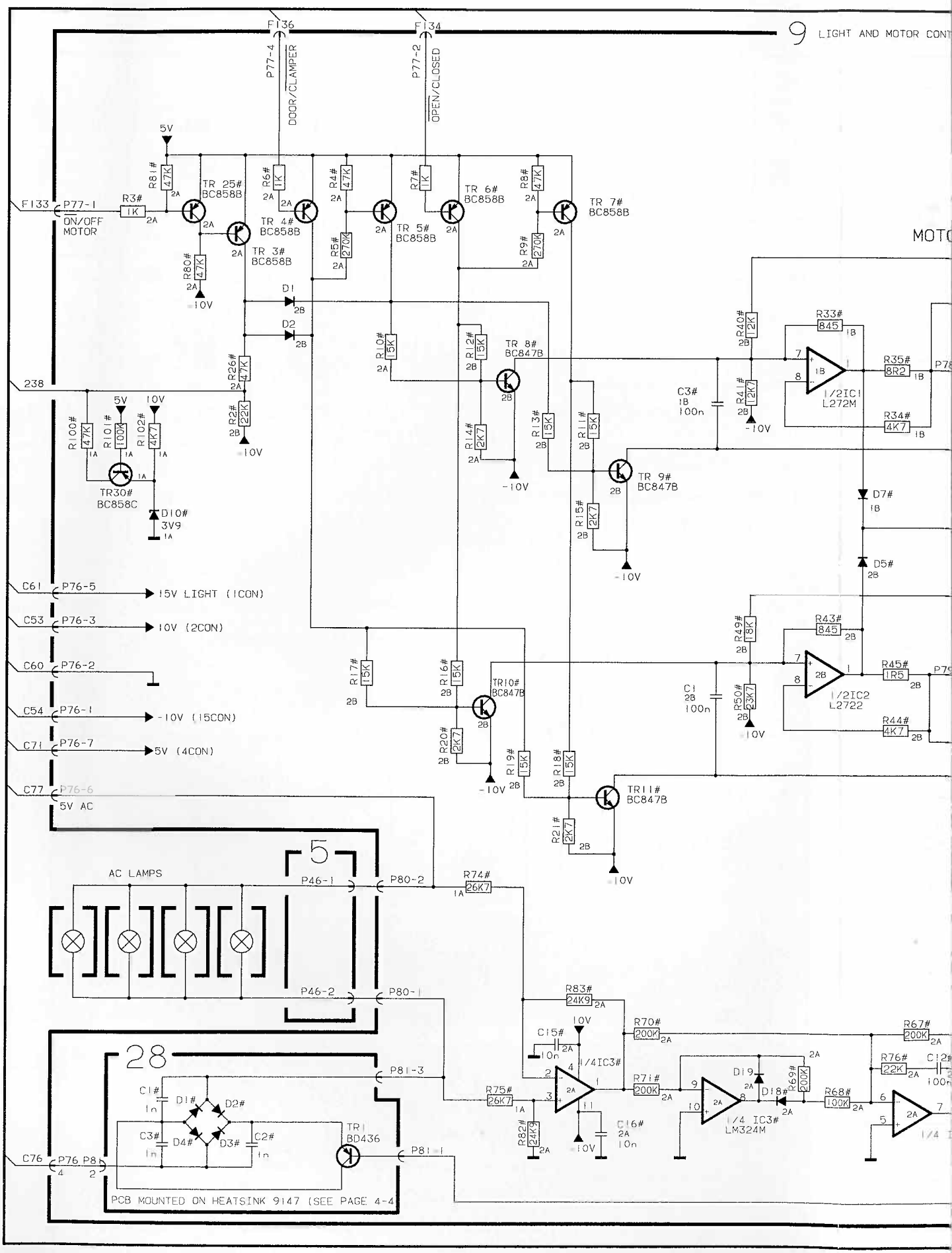


LIGHT CONTROL

LAMPS	15V LIGHT	P77-3	IC3 PIN 12
FULL	OFF	H	5V
FULL	ON	H	5V
HALF	ON	L	4V
OFF	OFF	L	0.4V

SMD COMPONENT

DIAGRAM K LIGHT AND MOTOR CONTROL



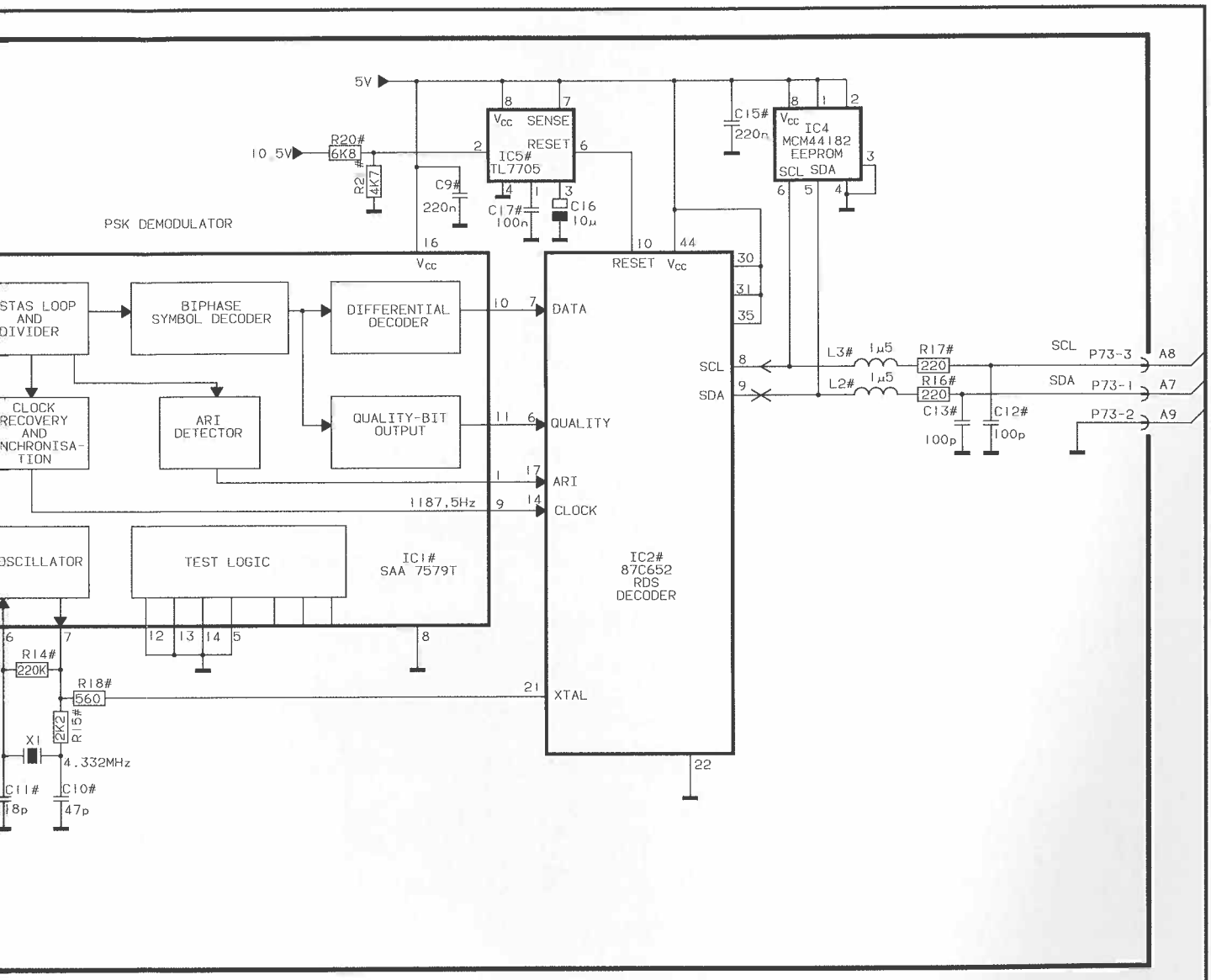
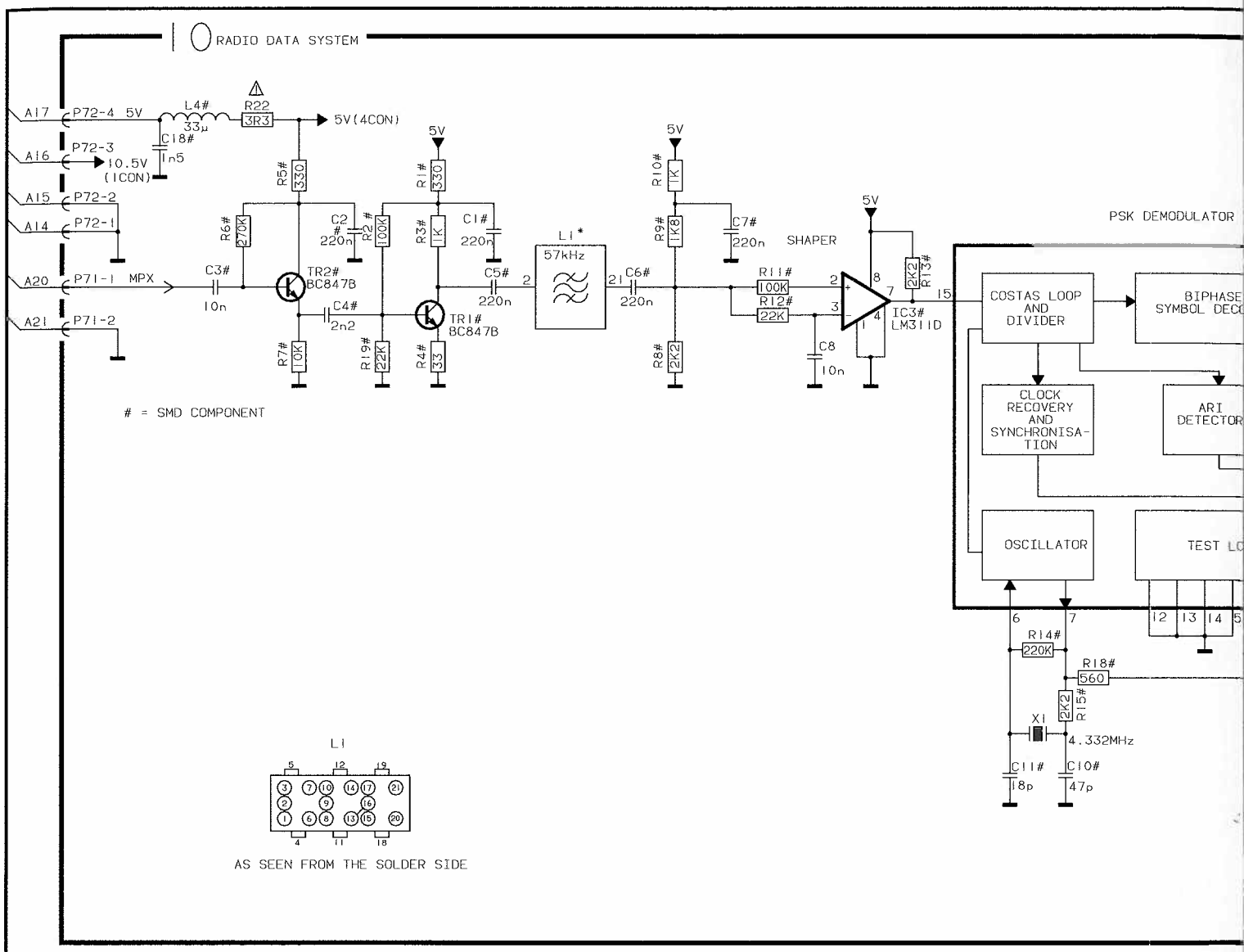
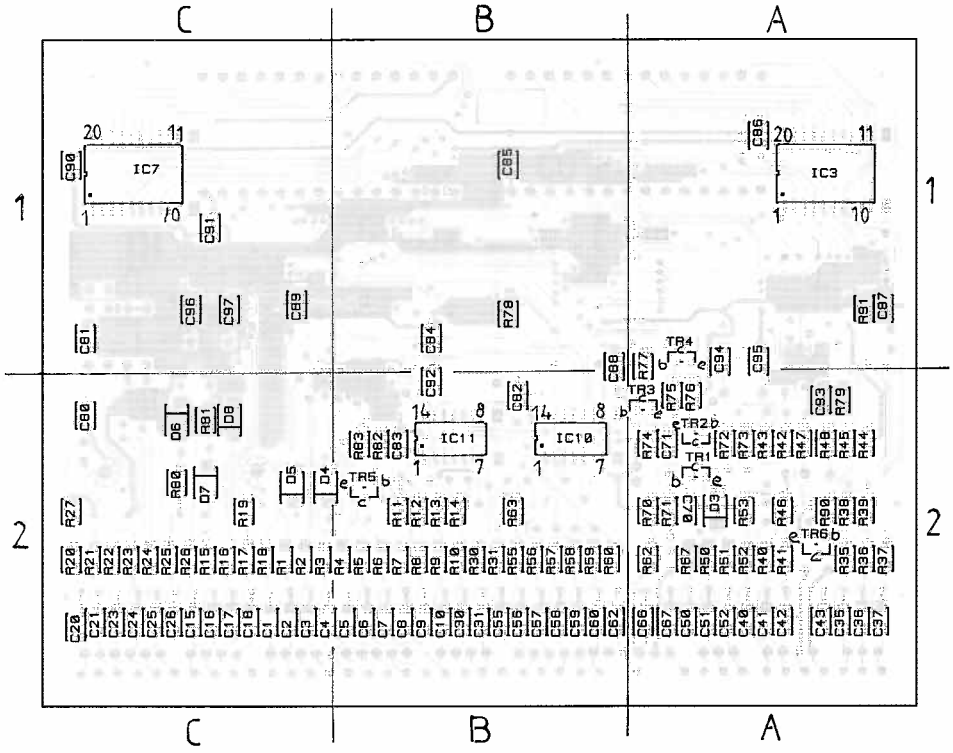

5V
10.5V
R20#
6K8
R21#
4K7
C9#
220n
IC5#
TL7705
SENSE
RESET
C17#
100n
C16
10µ
C15#
220n
IC4
MCM44182
EEPROM
SCL SDA
PSK DEMODULATOR
Vcc
RESET Vcc
STAS LOOP
AND
DIVIDER
BIPHASE
SYMBOL DECODER
DIFFERENTIAL
DECODER
DATA
CLOCK
RECOVERY
AND
NCHRONISA-
TION
ARI
DETECTOR
QUALITY-BIT
OUTPUT
QUALITY
ARI
1187.5Hz
CLOCK
SCL
SDA
L3# 1µ5
L2# 1µ5
R17#
R16#
220
C13#
100p
C12#
100p
P73-3
P73-1
P73-2
A8
A7
A9
OSCILLATOR
TEST LOGIC
IC1#
SAA 7579T
IC2#
87C652
RDS
DECODER
R14#
220K
R18#
560
R15#
2K2
X1
4.332MHz
C11#
18p
C10#
47p
XTAL

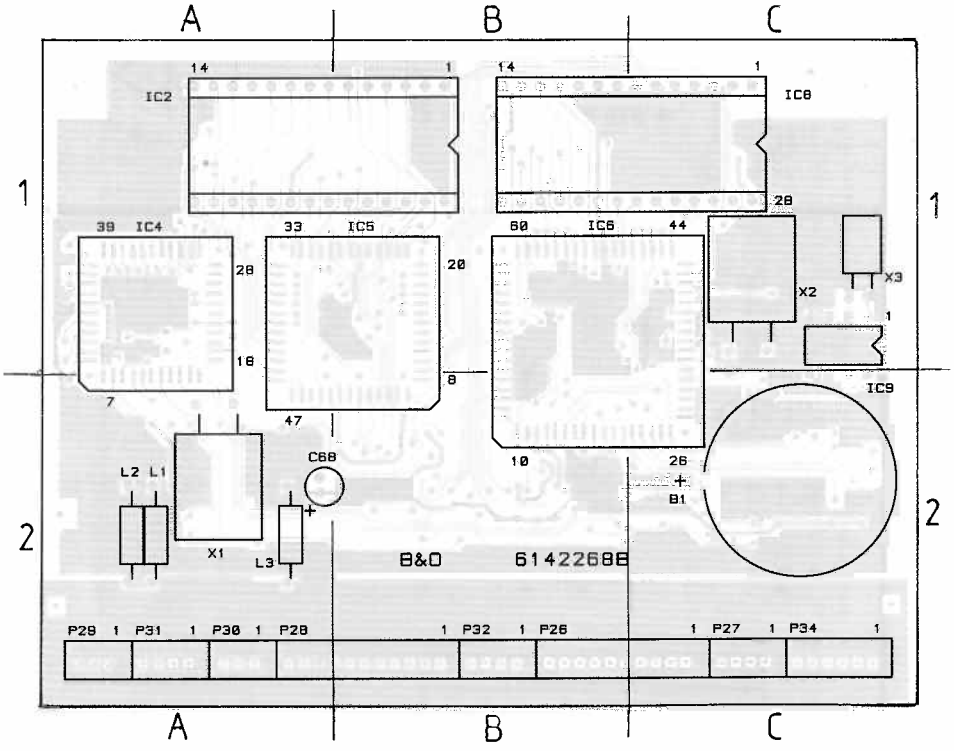
DIAGRAM L RADIO DATA SYSTEM



Bang&Olufsen

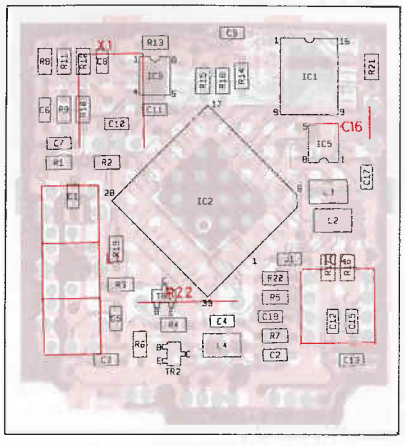
PCB 3 Microcomputer

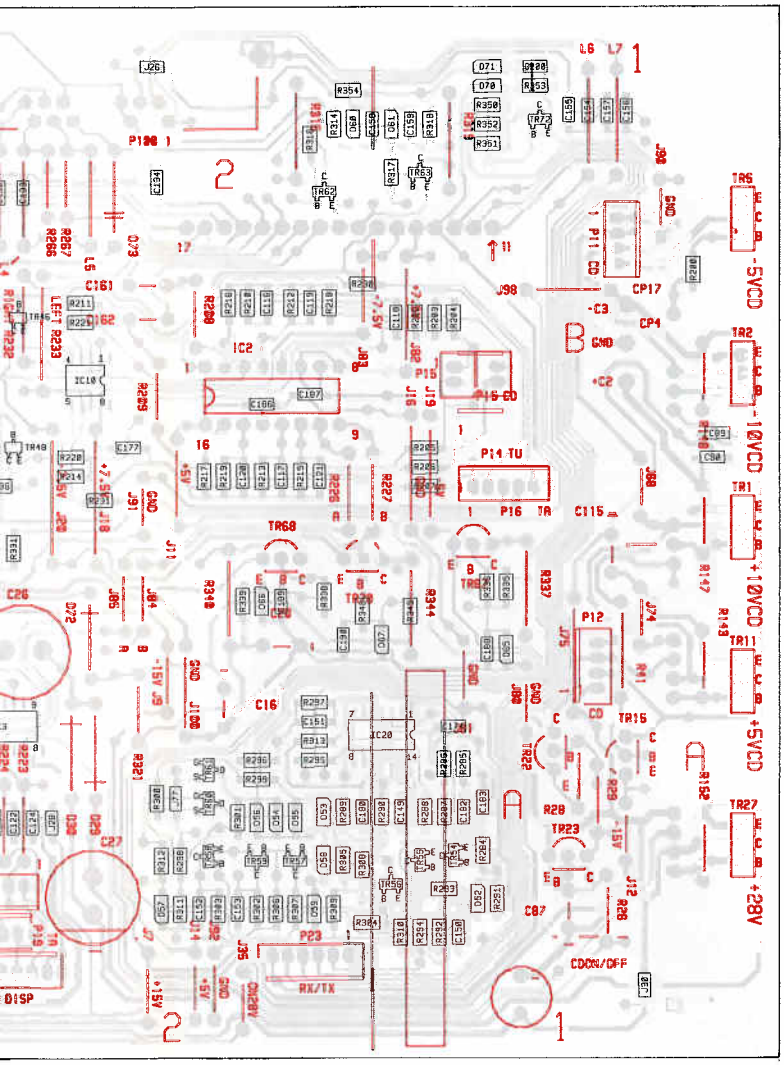


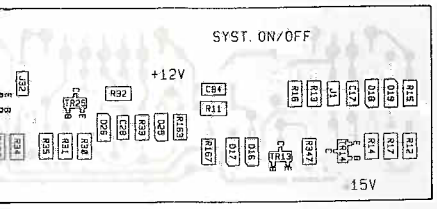


PCB 1 Tuner and IF System

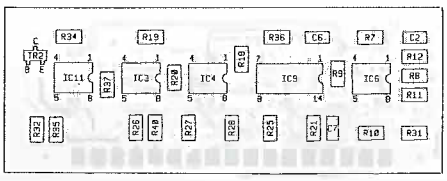
PCB 10 RDS

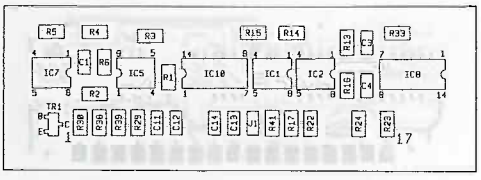






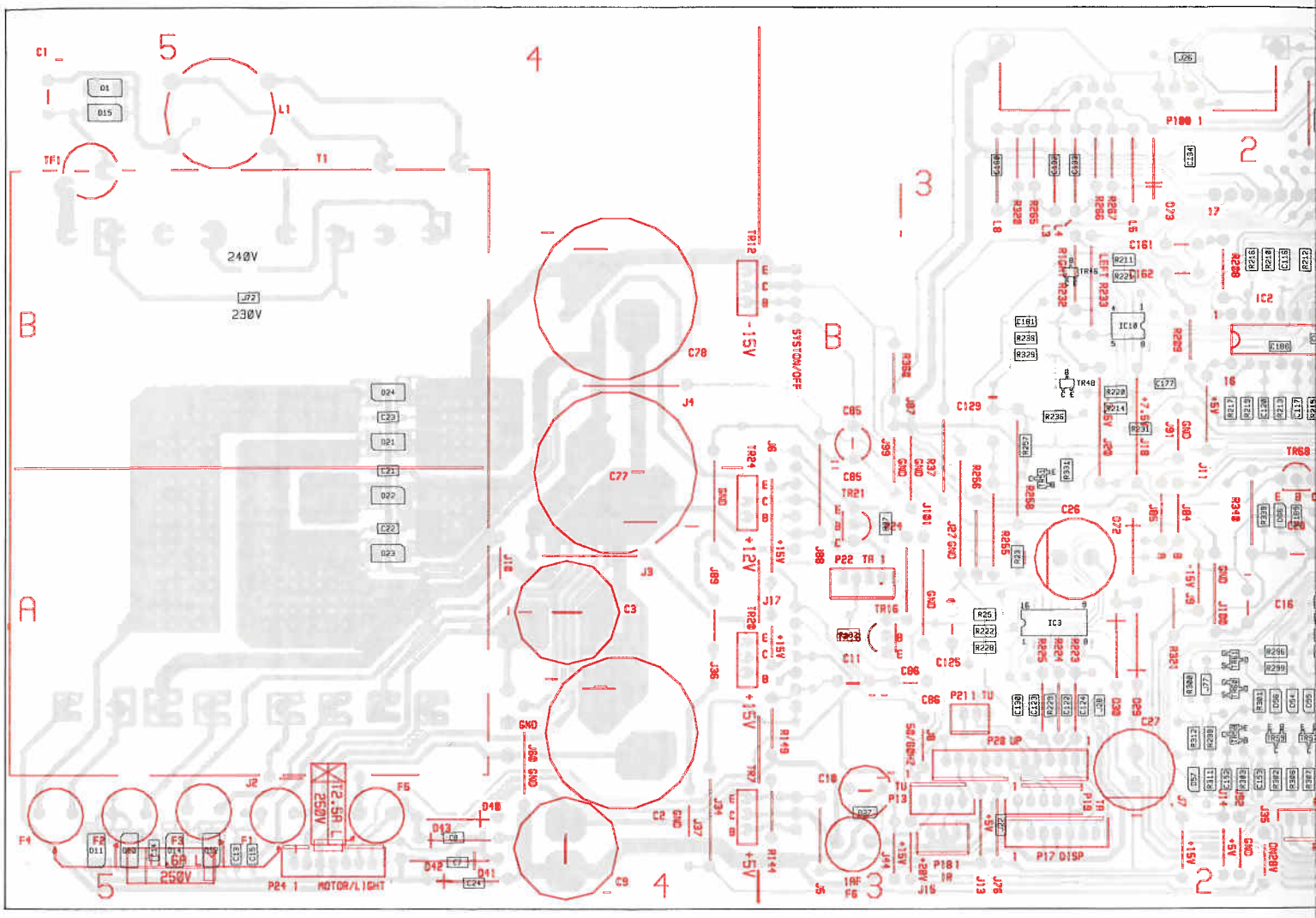
PCB Master Link Interface

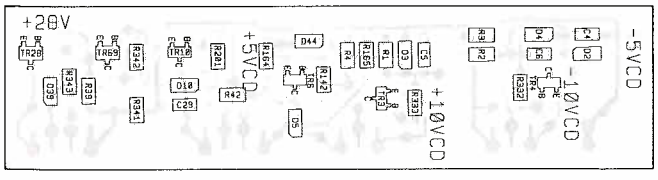


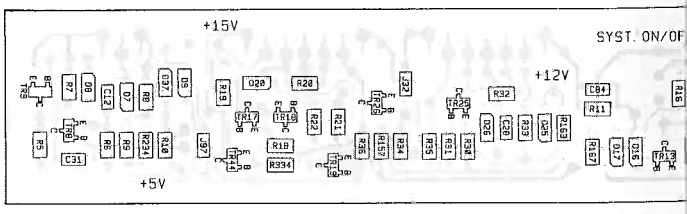


2-23
PCB DR

PCB 2 Power Supply and Input Select

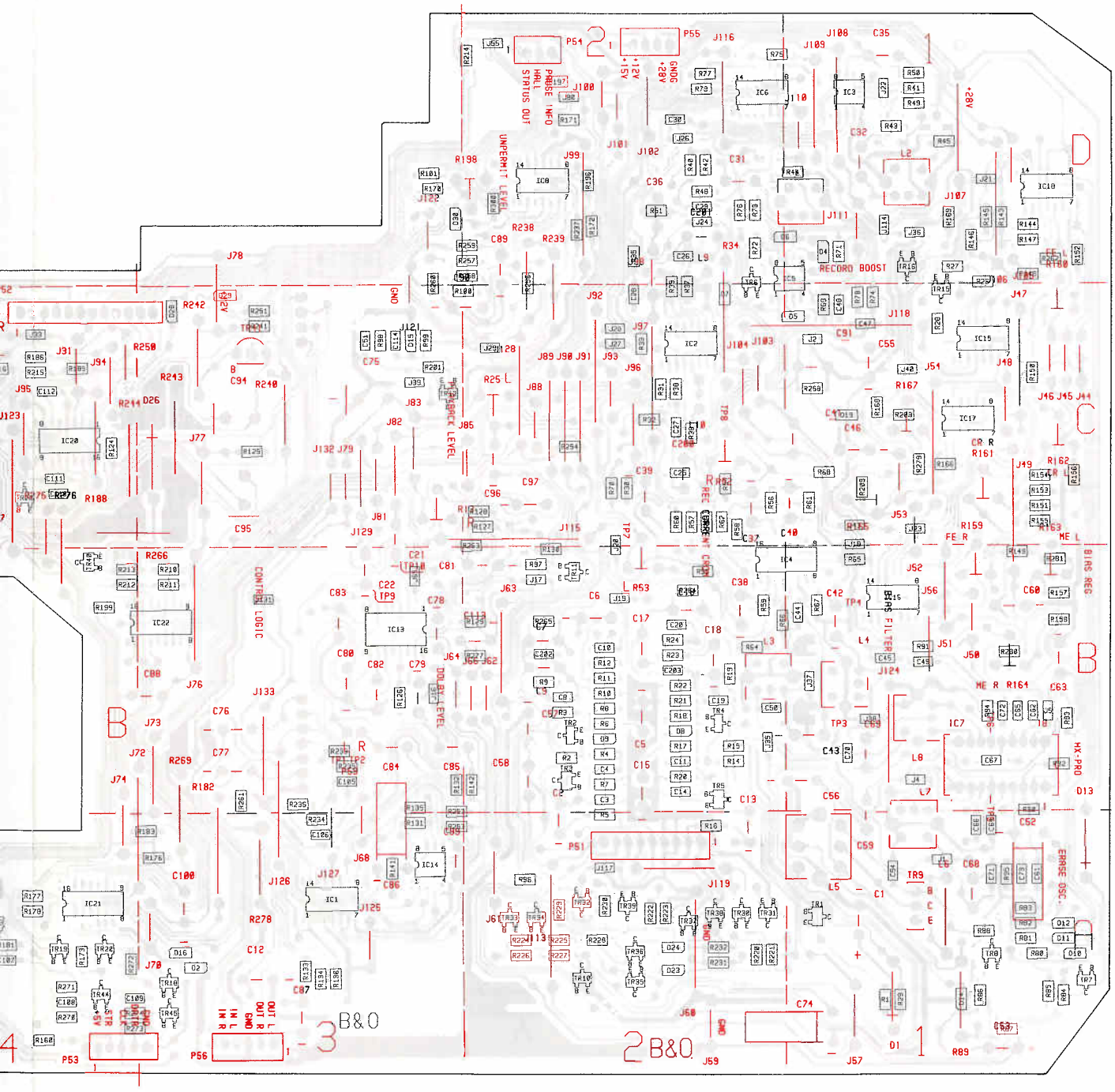




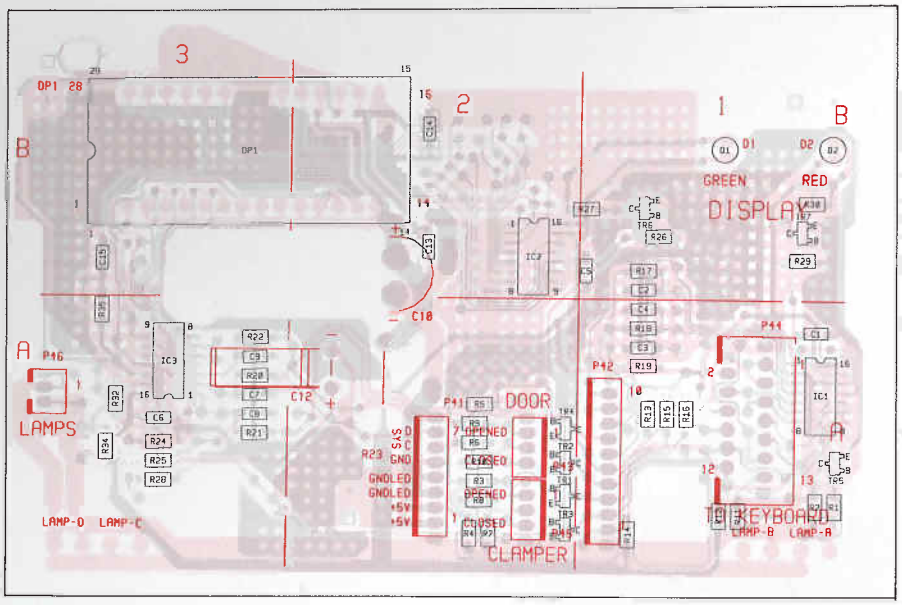


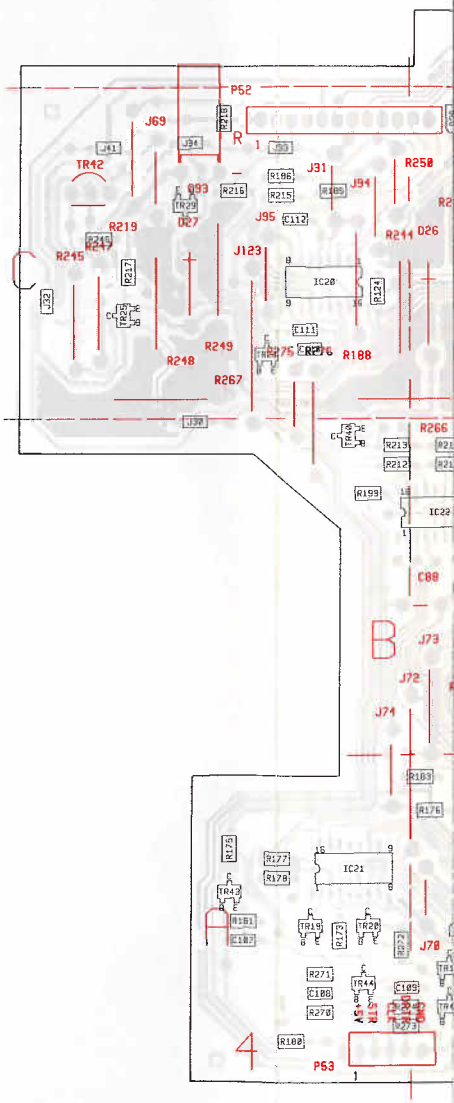
Bang&Olufsen

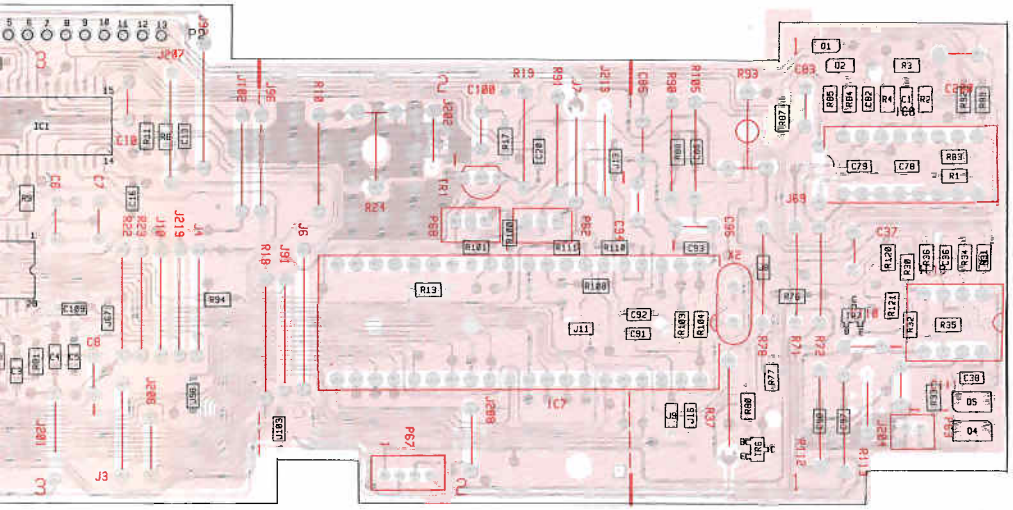
PCB 7 Tape



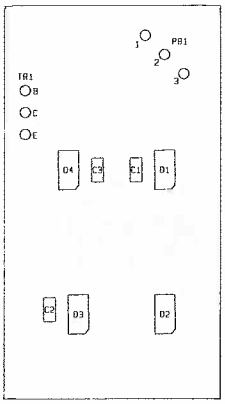
PCB 5 Display



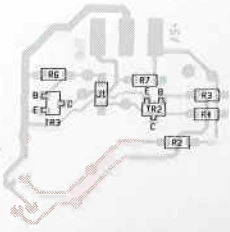




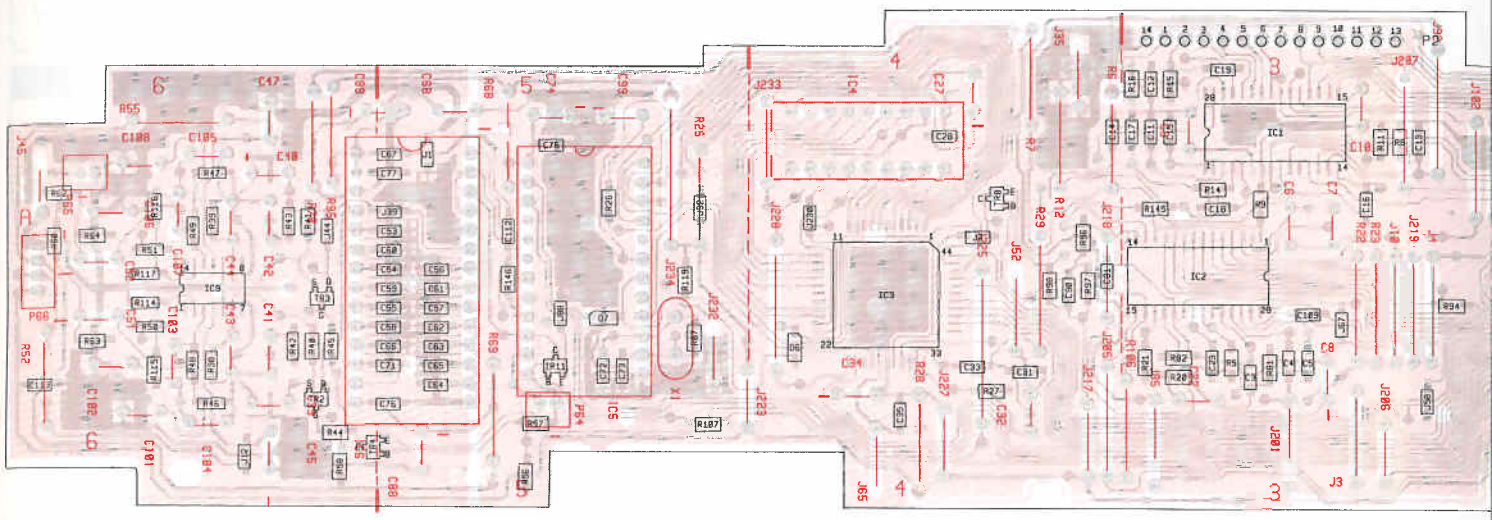
PCB 28 Light Control Output



PCB 20, Disc detector



PCB 8, CD, Version G



PCB, Light and motor control, Version G